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*Materials for a Flora of the Malayan Peninsula.*—By Sir GEORGE KING, K.C.I.E., LL.D., F.R.S., late Superintendent of the Royal Botanic Garden, Calcutta, and JAMES SYKES GAMBLE, Esq., C.I.E., M.A., F.R.S., late of the Indian Forest Department.

No. 15.

[Read March 2nd, 1904.]

In the last of these contributions thirty genera of *Rubiaceæ* were described. In the present one descriptions are given of the twenty-three remaining genera. Our account of the species of *Psychotria* ought to have been included here. But, owing to an unfortunate circumstance, it has been necessary to keep it back for publication in the next paper of the series. In the accompanying key to the genera, *Psychotria* is however included. The species described in the present paper number 123, and of these 47 are believed to be new.

Ovary 2-celled with 2 ovules in each cell, or imperfectly 4-celled with 1 ovule in each cell, always pendulous from about the middle of the septum; calyx-limb truncate; drupe with 2 or 4 pyrenes; flowers umbellate; corolla-lobes narrow, valvate in bud; scandent shrubs

... 31. COELOSPERMUM.

Ovules solitary in each cell; ovary 2- to many-celled:—

Radicle superior:—

Ovules pendulous from the apex of the cell:—

Fruit composed of several cohering woody pyrenes; stamens inserted on the mouth of the corolla-tube:—

Pyrenes 4 to 9: corolla imbricate, calyx-limb deciduous: shrubs or trees ... 32. GUETTARDA.

Pyrenes 12 to 24: corolla valvate; calyx-limb persistent, cupular: shrubs or trees ... 33. TIMONIUS.

Fruit 2-celled, consisting of 2 dry small indehiscent cocci; herbs with connate setaceous stipules ... 34. KNOXIA.

Ovules pendulous from the septum near its apex:—

Drupe with 2 free or cohering pyrenes; trees or shrubs with axillary inflorescence:—

Stipules equal: shrubs (often climbing); drupe didymous and 2-seeded or sub-globose and (by abortion) 1-seeded; seeds oblong ... 35. CANTHIUM.

Stipules unequal, (one very large); seeds cup-shaped; a tree ... 36. MESOPTERA.

Radicle inferior:—

Ovules on the septum of the ovary:—

Corolla-lobes imbricate in bud:—

Ovary 2-celled, each cell with an ovule on the middle of the septum; flowers ebracteate, in small supra-axillary clusters, 5-merous: calyx-lobes as long as the tube, thickened and persistent, stamens 5, inserted near the base of the corolla-tube; style short; stigma fusiform; fruit boldly 10-ridged; a shrub ... 37. GARDENIOPSIS.

Corolla-lobes twisted in bud:—

Ovary 2-celled, each cell with one ovule (in one species with 2 ovules); flowers 5-merous; style short, pubescent; stigmas stout and grooved: fruit with scanty pulp; seeds plano-convex, often cupped ... 38. WEBBERA.

Ovary 2-celled, each cell with one ovule inserted near the middle of the cell, not basilar; flowers 4-merous (5-merous in one species of *Ixora*); style long, slender, glabrous, exserted; stigmas slender, smooth; fruit globose or didymous with leathery or pulpy pericarp; pyrenes 2, coriaceous, each with a single plano-convex seed:—

Style exserted but never twice as long as the corolla-tube; stigma thicker than the style, bifid: stipules and bracts of the inflorescence coriaceous, usually small, the latter not sheathing; leaves usually coriaceous ... 39. IXORA.

Style very slender much longer (often twice



as long) than the corolla-tube; stigma not thicker than the style (sometimes thinner), usually entire; stipules and bracts of the inflorescence large and membranous (the latter sheathing); leaves membranous ...

40. PAVETTA.  
Corolla-lobes valvate in bud :—

Stamens 4 or 5, usually inserted on the mouth of the corolla (rarely in the tube); ovules usually inserted below (rarely above) the middle of the septum, amphitropous; fruit a 2- or 4-celled berry or a drupe with 2 or 4 pyrenes; trees or shrubs, (sometimes scandent):—

Flowers united by their calyx-tube into more or less fleshy heads :—

Heads many-flowered, ovoid, solitary or in axillary or terminal umbels or panicles; seeds obovoid or reniform ...

41. MORINDA.

Heads few-flowered, sub-spicate in terminal panicles; seeds thin, orbicular ...

42. RENNELLIA.

Flowers free :—

Flowers unisexual :—

Calyx-limb cupular; throat of corolla glabrous, stamens included in its tube; flowers terminal and axillary; berry 1- to 2-seeded; seeds sub-globose, peltate ...

43. PRISMATOMERIS.

Calyx-limb annular, truncate, entire or 5-toothed; throat of corolla woolly and bearing the stamens; flowers in axillary heads; drupe globose; seeds compressed ...

44. GYNOCHODES.

Flowers bisexual :—

Calyx-limb truncate, entire or obscurely lobed; throat of corolla glabrous or hairy; flowers in umbels; fruit a berry or drupe with 2 to 4 pyrenes; seeds obscurely trigonous ...

31. COELOSPERMUM.

Stamens 4, inserted on the throat of the corolla; style filiform; stigma capitate or bifid; ovules inserted on the middle of the septum; fruit a crustaceous or coriaceous dehiscent mericarp; seeds oblong or ovoid with ventral groove; herbs ...

45. SPERMACOCE.

Ovules basilar, erect :—

Corolla-lobes inflexed-valvate in bud :—

Stamens 4 or 5, inserted in the corolla-tube; style-arms 2, twisted; fruit capsular, compressed or globular, containing 2 dorsally compressed,—winged or cupped pyrenes often

pendulous from a columella; seeds compressed, the testa membranous; foetid climbing shrubs ... 46. PAEDERIA.  
 Corolla-lobes valvate in bud; stamens usually 4, but sometimes 5 to 7, inserted near mouth of the corolla; ovules cuneate, anatropous; drupe with 2 or more pyrenes:—

Flowers axillary and terminal, solitary or in small fascicles; anthers 4, sub-sessile:—

Calyx-limb dilated, unequally 4- to 6-lobed; drupe with 2 pyrenes; foetid terrestrial shrubs ... .. 47. SAPROSMA.

Calyx-limb truncate; drupe with 2 pyrenes; epiphytes with tuberous honey-combed stems 48. HYDNOPHYTUM.

Flowers solitary, capitate or fascicled, axillary or terminal:—

Flowers solitary; calyx with 4 rather long lobes; stamens 4 to 7; creeping herbs often with cordate leaves ... .. 49. GEOPHILA.

Flowers numerous, in heads surrounded by many large thick involucre; calyx-limb entire; style-arms 2; stamens 4 or 5 ... 50. CEPHAELIS.

Flowers in axillary fascicles or condensed cymes, calyx-limb 3- to 6-fid or entire and truncate; stamens 4 to 6; style-arms 3 to 9: leaves distichous, not cordate; pyrenes 3 to 9 51. LASIANTHUS.

Flowers in terminal (rarely axillary) corymbose or paniced, rarely capitate, never involucreate cymes:—

Calyx-limb short, 4- or 5-toothed; corolla-tube usually long and curved; seeds orbicular, very concave on the ventral surface ... 52. CHASALIA.

Calyx-limb short, 4- to 6-toothed; corolla-tube usually short, straight; seeds plano-convex ... .. 53. PSYCHOTRIA.\*

### 31. COELOSPERMUM, Blume.

Scandent glabrous shrubs; the young branches often compressed. *Leaves* coriaceous, elliptic, oblong or obovate, with few and indistinct nerves; stipules short, broad, connate below, acute or bifid at the apex, caducous and leaving an annular scar on the branch. *Flowers* in 3-6-flowered paniced umbels. *Calyx-tube* short, campanulate or hemispheric; the limb membranous, truncate or obscurely lobed, sometimes deciduous. *Corolla* coriaceous, clavate in bud, funnel-shaped or salver-shaped; the limb with 4 or 5 linear-oblong or lanceolate, sub-acute, patent or reflexed lobes longer than the tube, in bud valvate, the edges and apices often recurved. *Stamens* 4 or 5, on the throat of the corolla;

\* The descriptions of the species of this genus will be printed in No. 16 of the present series of papers.

filaments slender; anthers linear, versatile; exserted. *Ovary* 2-celled or imperfectly 4-celled; style filiform; stigmas 2, linear-lanceolate. *Ovules* 2 in each cell in the 2-celled species and 1 in each cell in the 4-celled species, on fleshy placentas. *Fruit* depressed-globular, dry or fleshy, containing 2 or 4 pyrenes.—*DISTRIB.* Malaya and Australia—about 10 species.

Limb of calyx membranous, deciduous: cells of ovary 2,				
each with 2 or more ovules	...	...	...	1. <i>C. truncatum.</i>
Limb of calyx coriaceous, permanent: cells of ovary 4,				
cells uni-ovulate	...	...	...	2. <i>C. scandens.</i>

1. *COELOSPERMUM TRUNCATUM*, King & Gamble. A shrubby glabrous creeper: youngest branches thinner than a goose-quill, pale-brown, terete. *Leaves* coriaceous, elliptic-oblong, or sub-obovate, shortly and rather obtusely acuminate, the base cuneate; both surfaces (when dry) dark-brown with a tinge of olivaceous, dull; the midrib depressed on the upper, prominent on the lower; main-nerves about 4 pairs, curving upwards, slender, distinct on the lower surface; length 3 to 4 in., in breadth 1·25 to 2·5 in.; petiole ·3 to ·5 in. *Stipules* small, transversely oblong, very short (often only ·05 in. long), pale: coriaceous, 2-lobed. *Panicles* about 1 in. long and twice as broad, ternately umbellate on the apex of naked compressed peduncles as long as or longer than the leaves: the umbels with 5 or 6 spreading flowers, minutely but deciduously bracteolate at the base. *Flowers* ·4 in. long, on unequal pedicels shorter than themselves. *Calyx-tube* campanulate, the limb membranous, truncate or obscurely 5-toothed, deciduous, ·1 in. long, *Corolla* ·35 in. long, clavate in bud, the tube short, hairy within, the throat glabrous, the lobes 5, valvate in bud, their apices inflexed. *Stamens* 5, inserted in the throat of the corolla. *Anthers* linear, exserted, versatile. *Ovary* 2-celled with ovules 2 (or more?) in each cell. *Coelospermum scandens*, Hook. fil. Fl. Br. Ind. III. 159 in part. *Trisciadia truncata*, Hook. fil. in Gen. Plant. II. 69; Fl. Br. Ind. III. 94. *Webera truncata*, Roxb. Fl. Ind. ed. Carey and Wall. II. 538. *Stylocoryna truncata*, Wall. Cat. 8403. *Cupia truncata*, DC. Prod. IV. 394. *Pseudixora truncata*, Miq. Fl. Ind. Bat. II. 210.

PENANG: *Wallich*. SINGAPORE: *Maingay* (K.D.) 933.

2. *COELOSPERMUM SCANDENS*, Blume Bijl. 994. Scandent: the young branches cylindric, pale-brown, thinner than a goose-quill. *Leaves* broadly elliptic, or obovate-elliptic, much narrowed to the base; midrib and 4 or 5 pairs of spreading nerves faintly depressed on the upper surface, slightly prominent on the lower; length 2·5 to 5 in.; petioles ·35 to ·6 in. *Stipules* less than ·1 in. long, narrow. *Peduncles* usually longer than the leaves, slender, compressed, bearing at the apex three pedunculate few-flowered umbels. *Flower-pedicels* unequal, shorter than

the flowers. *Calyx* campanulate, less than .1 in. long, the mouth truncate, usually with 5 minute teeth. *Corolla* four times as long as the calyx, clavate in bud, salver-shaped, coriaceous; the tube slender, longer than the 5 reflexed linear-oblong valvate lobes. *Anthers* as long as the corolla-lobes, much exserted. *Ovary* 4-celled, each cell with a single ovule. *Fruit* depressed-globular, .4 in. across and .35 in. long, glabrous, shining, smooth but with 4 shallow ventral grooves and a minute apical areolus: pyrenes two, each 2-seeded. DC. Prod. IV. 468; Hook fil. Fl. Br. Ind. III. 159 (in part).

MALACCA: *Griffith* (K.D.) 3087. SINGAPORE: *Ridley* 109; *Hullett* 623. PERAK: *King's Collector* 3992, 7248.

The material is imperfect and we describe the characters of the ovary and ovules with some hesitation.

### 32. GUETTARDA, Linn.

Trees or shrubs. *Leaves* sometimes three in a whorl; stipules deciduous. *Flowers* secund on the branches of axillary forked pedunculate cymes. *Calyx-tube* short; the limb tubular, toothed, usually deciduous. *Corolla* with a long cylindric straight or curved tube, the limb with 4 to 9 lobes imbricate in bud. *Anthers* 4 to 9, linear, subsessile, included within the glabrous tube. *Ovary* with 4 to 9 elongate cells, with a solitary ovule in each cell; style filiform; stigma sub-capitate. *Drupe* more or less globular, crowned by the short calyx-limb; endocarp 4- to 9-celled, perforated near the apices of the cells. *Seeds* pendulous, oblong cylindrical or curved, testa membranous, albumen scanty or none. —DISTRIB. About 45 species; mostly American.

1. GUETTARDA SPECIOSA, Linn. Sp. Pl. 991. A small evergreen polygamous tree; young branches as thick as a goose-quill, deciduously puberulous. *Leaves* membranous, broadly obovate or ovate, cuspidate, narrowed to the rounded or sometimes minutely cordate, rarely acute base; upper surface pale-brown when dry, glabrous; the lower pale-greenish, puberulous, minutely reticulate; main-nerves 7 to 8 pairs, little curved, spreading, thin but rather prominent on the lower surface, faint on the upper; length 4 to 8 or 10 in.; breadth 3 to 7 in.; petioles .5 to 1.5 in.; stipules lanceolate or oblong, deciduous, .3 in. long. *Cymes* axillary or from the axils of fallen leaves; few-flowered, little-branched, on puberulous peduncles 1.5 to 2.5 in. long. *Flowers* 1.5 to 2 in. long, some sessile others on short pedicels. *Calyx* about .2 in. long, minutely velvety; tube short-grooved; limb widely cupular, truncate entire or faintly and irregularly toothed. *Corolla* salver-shaped, many times longer than the calyx, softly pubescent outside; the tube narrow; the limb 1 in. in diam. divided into 7 or 8 obtuse lobes. *Style* glabrous stigma conical. *Drupe* depressed-ovoid or turbinate, woody, globose,



obscurely lobed, 4- to 6-celled, about 1 in. in diam. Lam. III., t. 154 f. 2; Roxb. Fl. Ind. I. 686. Wall. Cat. 6219; W. & A. Prod. Fl. Pen. Ind. 422; Wight Ic. t. 40; Kurz For. Flor. Burm. II. 37; Hook. fil. Fl. Br. Ind. III. 126. *Cadamba jasminiflora*, Sonner. Voy. Ind. II. t. 128. *Nictanthes hirsuta*, Linn. Sp. Pl. 8. *Jasminum hirsutum*, Willd. Sp. Pl. I. 36.—Rheede Hort. Mal. t. 47, 48.

In all the provinces—on the sea-coasts.—DISTRIB. Shores of the tropics of old and new worlds.

### 33. TIMONIUS, Rumph.

Shrubs or trees: stipules ovate-lanceolate, deciduous: leaves more or less coriaceous. *Flowers* rather small, polygamo-dioecious, in axillary cymes. *Male* cymes with few or many secund flowers. *Female* 1- to 3-flowered, the pedicels bibracteolate. *Calyx-tube* short; the limb cupular, persistent. *Corolla* coriaceous, pubescent, funnel-shaped; the throat and the tube within glabrous; limb with 4 or 5 (rarely with 10) lobes, valvate in bud or nearly so. *Stamens* as many as the lobes of the corolla, inserted by short filaments in the tube; anthers linear, dorsifixed. *Disk* small, hispid. *Ovary* many-celled; style short, thick, hairy, with several more or less united linear (often unequal) branches; *ovules* solitary in each cell, pendulous. *Fruit* ovoid or globose, usually 4-grooved, composed of 12 to 24 or even 30 small elongated 1-celled 1-seeded pyrenes cohering by their sides and sunk in a 4-armed, placentiform mass, the whole being enclosed in an epicarp crowned by the remains of the calyx. *Seeds* cylindrical, straight, rarely curved, with thick funicles and membranous testas; albumen scanty or absent: cotyledons small, radicle long.—DISTRIB. About 30 species, Tropical Asiatic and Polynesian.

Female flower solitary on a long peduncle:—

- |   |        |                           |
|---|--------|---------------------------|
| ♂ peduncles long, slender, glabrous; leaves glabrous except the nerves beneath; fruit 4-grooved, glabrous | ... .. | 1. <i>T. Jambosella</i> . |
| ♂ peduncles short, rusty-pubescent; leaves rusty-pubescent beneath; fruit not grooved, rusty-pubescent    | ... .. | 2. <i>T. Wrayii</i> .     |
| Female flowers in small pedunculate cymes   | ... .. | 3. <i>T. Rumphii</i> .    |

*Species of which ♂ flower and fruit are unknown:—*

- |  |        |                            |
|--|--------|----------------------------|
| Stipules triangular, acuminate                                 | ... .. | 4. <i>T. laxus</i> .       |
| Stipules cupular, the mouth with several unequal linear points | ... .. | 5. <i>T. malaccensis</i> . |

1. TIMONIUS JAMBOSILLA, Thwaites Enum. Pl. Ceyl. 153. A small ever-green tree or shrub; young branches thinner than a goose-quill, brown when dry, glabrous or sparingly silky. *Leaves* coriaceous, their margins sometimes recurved, lanceolate, elliptic-lanceolate, or elliptic, acuminate, the base narrowed, cuneate; both surfaces dull-brown when



dry, glabrous; the lower paler, faintly reticulate; main-nerves 5 or 6 pairs, curving upwards, prominent and silky on the lower surface, less prominent and glabrous on the upper; length 2·5 to 4 in.; breadth 1 to 2·5; petioles ·1 to ·3 in.; stipules lanceolate, acuminate, silky, slightly exceeding the petioles. *Male* cymes 3- to 12-flowered, on peduncles ·35 to ·75 in. long. *Female* flowers solitary, on peduncles longer than those of the males: the calyx 4-gonous; suburceolate, the mouth with 4 shallow obscure teeth. *Corolla* hypocrateriform, ·3 to ·5 in. long, the throat valvate. *Anthers* slightly exserted. *Disk* large. *Stigmas* 4, *Fruit* at first ellipsoid, but when peridepressed-globose, 4-gonous, subtruncate, about ·35 in. across, crowned by the calyx-limb and large disk; crustaceous; covered by a smooth pericarp: the placentas 4, cruciate, each bearing about 6 ovules sunk in pits. *Bedd. Ic. Pl. Ind. Or. t. 190*; *Hook. fil. Fl. Br. Ind. III, 127*. *T. flavescens*, *Baker Fl. Maurit. 144*. *Nelitris Jambosella*, *Gaertn. Fruct. I. 134, t. 90 (excl. syn.)*. *Helospora flavescens*, *Jack in Trans. Linn. Soc. XIV. 127, t. 4, f. 3*; *DC. Prod. IV. 391*; *Miq. Fl. Ind. Bat. II. 234*. *Euppyrena glabra*, *W. & A. Prod. 423*. *Bobea glabra*, *Korth. in Ned. Kruidk. Arch. II. 211*. *Polyphragmon flavescens*, *Kurz For. Fl. Burm. II. 38*. *Guettarda? peduncularis*, *Wall, Cat. 6222*; *Don. Gen. Syst. III. 551*. *G. Brunonis* and *G. missionis* *Wall. Cat. 6220, 6221*.

In all the provinces: common.—*DISTRIB.* Andaman Islands  
Ceylon, Malay Archipelago.

*VAR. Finlaysoniana*; leaves elliptic or elliptic-oblancolate, shortly acuminate or acute, 3 to 5·5 in. long, the petioles ·3 to ·6 in. long, fruit, nearly ·5 in. in diam. *T. Finlaysoniana*, *Hook. fil. Fl. Br. Ind. III. 127*. *Guettarda Finlaysoniana*, *Wall. Cat. 6223*. *G. peduncularis*, *Wall. Cat. 6222*. *Timonius*, *Wall. Cat. 8446*.

*SINGAPORE*: *Wallich, G. Thomson, Ridley 2762*. *PENANG*: *Curtis 3388*. *PERAK*: *King's Collector 1529, 6209*. *ANDAMAN ISLANDS*: *King's Collector*.

2. *TIMONIUS WRAYI*, *King & Gamble, n. sp.* A tree 20 to 50 feet high; young branches as thick as a goose-quill, dark-brown when dry, the leaf-cicatrices large, distinct. *Leaves* coriaceous, elliptic or obovate-elliptic, sometimes rhomboidal, the apex acute, the base much narrowed into the long petiole; upper surface olivaceous-brown when dry, glabrous everywhere and shining; the lower paler, dull, the nerves and midrib adpressed rusty-sericeous, otherwise glabrous; main-nerves 6 or 7 pairs, only slightly curved, ascending, very bold on the lower surface like the midrib, somewhat depressed on the upper; length 5·5 to 8 in.; breadth 2·25 to 4·5 in.; petiole ·6 to 1·5 in.; stipules lanceolate, acuminate, sparsely sericeous, about ·5 in. long. *Male cymes* pedunculate, dichotomous, 6- to 8-flowered, the branches bracteate, short, spreading,

everywhere densely rusty-pubescent: the peduncle about .5 in. long; flowers secund, sessile. *Calyx* .3 in. long, cylindric, campanulate with 4 broad blunt unequal lobes, densely rusty-pubescent outside. *Corolla* coriaceous with wide short tube and 4 blunt, concave, slightly imbricate lobes nearly as long as the tube, rusty-pubescent outside. *Anthers* 4, included, linear, sessile. *Female flower* not seen. *Fruit* solitary on a peduncle longer than that of the male cyme, ellipsoid or globose, crowned by the large calyx and with a single oblong bract at its base, minutely rusty-pubescent, .6 in. in diam. when dry. *Seeds* about 12, in pits on the cruciform placentas.

PERAK: *Wray* 3200, *King's Collector* 5168.

This species is very distinct from the others described here. Its nearest ally is one from New Guinea, to which Dr. Scheffer gave the MS. name *Polyphragmon sessile*. But the latter has smaller leaves, more hairy below and with rather more main-nerves; the petioles moreover are shorter, and the fruits have peduncles less than .1 in. long.

3. *TIMONIUS RUMPHII*, DC. Prod. IV. 461 A small tree. Young branches twice as thick as a crow-quill, striate, sparsely pubescent at first, finally glabrous. *Leaves* thinly coriaceous or membranous, narrowly elliptic, somewhat oblanceolate, shortly and bluntly acuminate, much narrowed at the base: upper surface dark-brown when dry, usually glabrous except for a few hairs on the midrib; the lower paler, minutely reticulate and with fine white adpressed-sericeous hairs; main-nerves 8 or 9 pairs, slightly curved, ascending, thin and faint on the lower surface, almost obsolete on the upper; length 3.5 to 5.5 in.; breadth, 1.5 to 2 in.; petiole .25 to .4 in.; pubescent; stipules lanceolate, caudate-acuminate, shorter than the petioles. *Male cymes* many-flowered pubescent, with many divergent trichotomous branches; the flowers .3 to .5 in. long, secund, sessile, pubescent; *calyx* campanulate .05 in. long. *Female cymes* trichotomous, on peduncles 1 to 1.25 in. long, and sometimes bearing small leaves. *Flowers* in threes, the middle one sessile, the two lateral pedicellate, .4 in. long. *Calyx* with a subulate bracteole at its base, about as long as the pedicel; the tube narrowly campanulate 4-grooved, densely tomentose, somewhat constricted at the base of the less hairy limb; lobes of limb 4, ovate, subacute, spreading. *Corolla* coriaceous, .3 in. long, twice as long as the calyx, outside adpressed-pubescent, inside glabrous; the tube cylindric; the mouth with 4 blunt lobes. *Anthers* 4, linear-oblong, sessile. *Style* stout, grooved by the pressure of the anthers, stigmatic lobes small. *Fruit* ellipsoid to subglobose, tetragonous, crowned by the erect calyx-lobes, densely covered with short white deciduous pubescence, .35 in. long: the placentas cruciate bearing many seeds, each enclosed in a woody pyrene. Hook.

fl. Fl. Br. Ind. III. 127: Wall. Cat. 6217. *Bobea Wallichiana*, Korth in Ned. Kruidk. Arch. II. 211.—Rumph. Herb. Amb. III. 216 t. 140.

In all the provinces: common;—DISTRIB. Malay Archipelago.

Near *T. Jambosella*, but with more hairy leaves, more numerous main-nerves and hairier inflorescence. The female flowers are in small cymes instead of being solitary as in that species.

4. *TIMONIUS LAXUS*, King & Gamble, n. sp. A tree 20 to 30 feet high; young branches thicker than a crow-quill, covered with coarse short rusty-deciduous hairs, the leaf-cicatrices bold. *Leaves* thickly membranous, narrowly elliptic-obovate, shortly acuminate, the base cuneate: upper surface dark-brown when dry, glabrous; the lower paler, minutely rusty-pubescent especially on the nerves and stout midrib; main-nerves 5 or 6 pairs, curved upwards, bold on the lower surface, slightly depressed on the upper; length 3·5 to 5 in.; breadth 1·5 to 2·25 in.: petioles ·1 to ·15 in.; stipules about ·35 in. long, triangular with long apices, the midrib rusty-pubescent. *Male cymes* on slender pubescent peduncles 1 to 2 in. long, with 2 diverging 1- to 2-flowered branches and a sessile flower at the fork. *Flowers* 3·5 in. long, those on the branches on pedicels ·3 in. long. *Calyx* cupular, subentire, less than ·1 in. long. *Corolla* thickly coriaceous, outside with dense yellowish-brown silky tomentum, inside nearly glabrous, the tube cylindrical, the mouth with 4 broad blunt lobes one-third of the length of the tube. *Female flowers and fruit* unknown.

PERAK: *King's Collector* 10609.

This has been collected only once and its female flowers and fruit are unknown. It appears to be near *T. Jambosella* but differs in its hairy leaves and lax, long-peduncled male cymes.

5. *TIMONIUS MALACCENSIS*, King & Gamble, n. sp. A small tree? Young branches slender, obtusely 4-angled, clothed in dense pale minute tomentum. *Leaves* membranous, broadly oblanceolate or elliptic, bluntly and shortly acuminate, narrowed to the base; upper surface glabrous, the midrib alone minutely rufous, puberulous when young, pale-brown when dry; the lower paler, reticulate, with sparse slender pale hairs, the midrib and main-nerves cinereous-tomentose; main-nerves 5 or 6 pairs, little curved, ascending; length 3·5 to 4·5 in., breadth 1·5 to 1·75 in.; petioles ·15 to ·2 in.; stipules shortly cupular the mouth with several unequal filiform processes, two being very long. *Cymes* 2 or 3 in the uppermost leaf-axils, about 6-flowered, one quarter of the length of the leaves, tomentose; their peduncles ·35 to ·6 in. long. *Flowers* densely pubescent outside, their pedicels ·05 in. long. *Calyx* tomentose, slightly more than ·1 in. long, campanulate: the mouth with 4 broad, triangular, spreading lobes. *Corolla* nearly twice as long as the



calyx, salver-shaped, pubescent outside, glabrous inside except the villous throat; limb with 4 ovate-lanceolate sub-acute lobes. *Anthers* 4, sessile in the throat, short, elliptic. *Style* stout, elongate, sparsely hairy below, divided into several broad flat truncate stigmatic lobes. *Fruit* unknown.

MALACCA: (on Mount Ophir) *Ridley* 3217.

This differs notably from *T. Rumphii* in its shorter flowers and its stipules, the leaves also differ. It has been only once collected.

Erect herbs or under-shrubs; stems terete or obtusely angled with linear lines of hairs or glabrous. *Leaves* equal, usually narrow, stipules connate with the petiole to form a truncate cup often with bristles on its mouth. *Flowers* white, pink or lilac, small, dimorphous, in corymbose cymes. *Calyx-tube* ovoid or didymous; teeth 4 minute, subequal or 1 or 2 elongate, persistent. *Corolla-tube* long, its throat villous; lobes 4, valvate in bud, with the tips inflexed. *Stamens* 4, inserted on the throat; anthers linear, included or exerted. *Ovary* 2-celled: style filiform: stigma included or exerted, 2-lobed: ovules solitary in each cell, pendulous. *Fruit* globose or oblong, small, of two semi-terete or dorsally compressed indehiscent cocci. *Seeds* with membranous testa and thick funiculus; albumen fleshy; embryo axile, the cotyledons thin and the radicle superior.—DISTRIB. Species about 10: Indian Malayan and Australian.

KNOXIA CORYMBOSA, Willd. Sp. Plant I. 582. Herbaceous, 1 to 4 feet high. *Stem* terete or obscurely 4-angled, little-branched, pubescent, tomentose or villous, never glabrous. *Leaves* membranous, pale-brown and somewhat olivaceous when dry, petiolate or sessile, narrowly elliptic, linear or ovate-lanceolate, tapered to each end, the apex acuminate; both surfaces hairy like the stems: main-nerve 5 to 9 pairs, rather straight, ascending, most prominent on the lower surface; length 1.5 to 5 in.; breadth .4 to 1 in.; petiole .2 to .4 in. or more. *Stipules* narrowly cupular, their edges with bristles .1 to .2 in. long. *Corymbs* on the end of the branches, shorter than the leaves, minutely bracteolate, trichotomous; the ultimate branches spicate when in fruit. *Flowers* .05 in. long, on peduncles shorter than themselves, white or purplish. *Calyx* ovoid, with 4 broad blunt triangular sub-equal teeth. *Corolla-tube* hairy within. *Fruit* less than .1 in. long, puberulous. W. & A. Prod. 439; Wight Ill. t. 123: Dalz & Gibs. Fl. Bomb. 111. Hook fil. Fl. Br. Ind. III. 128. *K. teres*, DC. Prod. IV. 569; Wall. Cat. 819 in part. *K. exserta*, DC. l.c. *K. umbellata*, Banks; Spreng. Syst. I. 406. *K. sumatrensis*, Wall. Cat. 6183. *K. mollis*, Br. in Wall. Cat. 820, not of W. & A. *K. stricta*, Thw. Enum. 152. *Spermacoce?* *teres* and *S. exserta*, Roxb. Hort Beng. 10; Fl. Ind. I. 367, 368: Ed. Carey & Wall. I. 373, 374. *S. sumatrensis*, Retz Obs. IV. 23, ex Cham. & Schl. in

Linnæa, III. 316 (not of Roxb. *Fl. Ind. I. 336*?) *Cuncea trifida*, Ham. in Don Prodr. 135.

In all the provinces.—DISTRIB. Malayan Archipelago, British India, tropical Australia.

CANTHIUM, Lam.

Shrubs (sometimes climbing), unarmed or spinous, their stipules of tenconnate. *Flowers* small, axillary, fascicled, or in corymbose, often pedunculate, cymes; sometimes polygamous. *Calyx* with short tube and short persistent or deciduous capular 4- or 5-toothed limb. *Corolla-tube* funnel-shaped, campanulate or urceolate, usually with a ring of deflexed hairs in the throat; limb 4-5-lobed, valvate in bud, finally reflexed. *Anthers* equal in number to the lobes of the limb, inserted in the mouth or throat of the corolla, sessile or on short filaments. *Disk* annular, tumid or depressed. *Ovary* 2-celled; style stout; stigma large, entire or bifid; ovules solitary in the loculi and pendulous. *Drupe* didymous or sub-globose or (when one of the carpels is suppressed) reniform, with 1-2 pyrenes, or a 2-celled putamen. *Seeds* pendulous, oblong, with membranous testa and fleshy albumen; embryo elongate, sub-terete; the cotyledons short and the radicle superior.—DISTRIB. About 80 species; in Asia, Africa, tropical Australia and Polynesia.

Flowers 1 in. long, solitary or in pairs, axillary ... 1. *C. pauciflorum*.

Flowers less than .5 in. long, in axillary cymes:—

Spiny straggling or scandent shrubs with more or less hairy leaves:—

Leaves rarely so much as 1.5 in. long, with 3 pairs of main-nerves, the remains of the calyx on the top of the fruit inconspicuous ... 2. *C. parvifolium*.

Leaves 2 to 3 in. long with 5 pairs of main-nerves: fruit crowned by the large calyx-tube ... 3. *C. molle*.

Unarmed trees or shrubs, glabrous or nearly so:—

Corolla-tube wide, short:—

Fruit much compressed, obovate, about .15 in. long; pyrenes not keeled: whole plant quite glabrous ... 4. *C. confertum*.

Fruit ellipsoid, smooth, obscurely 4-angled, somewhat compressed, 1 in. or more in length: pyrenes prominently keeled on the back, not warted; leaves with a few adpressed hairs on their lower surface ... 5. *C. glabrum*.

Corolla salver-shaped, the tube very narrow. Fruit much compressed, didymous, minutely velvety, .25 to 6 in. long: pyrenes warted, not keeled: leaves quite glabrous ... 6. *C. didymum*.

1. CANTHIUM PAUCIFLORUM, King & Gamble, n. sp. A spiny glabrous shrub 15 to 20 feet high: young branches thicker than a



crowquill, pale, terete; spines few, slender, curved, shorter than the petioles, supra-axillary. *Leaves* membranous, elliptic-ovate, shortly and somewhat obtusely acuminate, the base cuneate; both surfaces pale olivaceous-brown when dry, dull; main-nerves 4 to 5 pairs, spreading, somewhat prominent on the lower surface but evanescent at the tips, almost obsolete on the upper; length 4 or 5 in.; breadth 1.5 to 2.25 in.; petioles .15 to .25 in.; stipules small, broadly triangular. *Flowers* about 1 in. long, solitary or in pairs on a short minutely bracteolate axillary branch. *Calyx* .2 in. long, cupular-campanulate, the mouth with 5 short broad acute teeth. *Corolla* with a wide cylindrical tube .5 in. long, having a ring of hairs inside near the base, otherwise glabrous; the limb with 5 lanceolate erect or spreading lobes half as long as the tube. *Anthers* exerted, narrowly oblong, inserted by short filaments in the glabrous throat. *Ovary* 2-celled; style exerted; stigma mitriform, oblong, 2-partite. *Fruit* nearly 1 in. long, pulpy, smooth, crowned by the large wide calyx-tube. *Plectronia pauciflora*, K. & G. MS.

PERAK: *Scortechini*, 62.

At once distinguishable by its large flowers, solitary or in pairs.

2. *CANTHIUM PARVIFOLIUM*, Roxb. Hort. Beng. 15: Fl. Br. Ind. I. 534. A rambling spiny shrub often subscaudent or scaudent; young branches thicker than a crow-quill, angled, at first densely rusty addressed-pilose, ultimately often sub-glabrous; spines supra-axillary, .05 to .2 in. in length, straight or curved, pubescent at the base, the tips glabrous and shining. *Leaves* small, subcoriaceous, greenish when dry, ovate or elliptic, acute, the base cuneate; upper surface glabrous; the lower often sparsely hairy; the three pairs of slightly curved ascending main-nerves and the midrib pubescent usually on both surfaces; length .75 to 1.5 in.; breadth .5 to .75 in.; petioles .05 to .15 in.; stipules broad and short with an acute abrupt point. *Flowers*. .2 in. long, in small axillary clusters, on short pedicels. *Calyx* cupular-truncate, entire, or minutely 4- to 5-toothed. *Corolla* several times longer than the calyx: the tube widely tubular in bud and constricted below the limb, when expanded the tube globular, glabrous outside, but with a ring of dense deflexed white hairs inside; the limb with 4 or 5 lanceolate deflexed lobes. *Anthers* partly exerted, ovate, on short filaments. *Stigma* mitriform, sulcate. *Fruit* when ripe the size of a small cherry or black currant, glabrous. DC. Prod. IV, 474. Hook. fil. Fl. Br. Ind. III, 135. *C. scandens*, Blume Bijdr. 966; DC. Prod. IV, 475. *C. horridum*, Blume Bijdr. 966; DC. Prod. IV, 474; Miq. Fl. Ind. Bat. II, 255; Hook. fil. Fl. Br. Ind. III, 135. *Plectronia parvifolia* and *P. horrida*, Kurz. For. Fl. Burm. II, 36. *Gardenia rigida*, Wall. Cat. 8257 in part. *C. zizyphinum*, Wall. Cat. 8288 A. C. Rubiaceae, Wall. Cat. 8288

B. *Hyptianthera rhamnoides*, Zoll. et Mor. in Zoll. Syst. Verzeichn. 60.  
*Dondisia horrida*, Korth. in Ned. Kruidk. Arch. II, 236.

In all the provinces: not uncommon.

We have here reduced Blume's species *C. horridum* to the older one of Roxburgh; for we can find no character to separate the two, the form of the spines the size of the fruit, and the amount of pubescence hitherto relied upon being as a matter of fact inconstant.

3. *CANTHIUM MOLLE*, King & Gamble, n. sp. A straggling spiny shrub (? scandent); all parts more or less densely pale rusty-pubescent; the young branches thinner than a goose-quill, dark-brown, more or less 4-angled; spines stout, supra-axillary, much curved downwards, .2 to .6 in. long. *Leaves* thickly membranous, ovate to ovate-lanceolate, shortly acuminate, the base cuneate or rounded; main-nerves about 5 pairs, spreading, slightly prominent on the lower surface when dry, obsolete on the upper; length 2 to 3 in.; breadth .75 to 1.5 in.; petioles .15 to .2 in.; stipules broadly triangular, apiculate, very short. *Flowers* .2 in. long, on pedicels nearly as long, in small axillary cymes or on short, minutely bracteolate, sometimes leaf-bearing, axillary branches. *Calyx* small, cupular, with 5 small acute teeth. *Corolla* with a wide tube glabrous outside, but inside with a ring from the throat of long deflexed white stout hairs: the lobes of the limb about as long as the tube, narrowly oblong, glabrous, deflexed. *Anthers* sessile, shortly oblong, exserted. *Style* exserted; stigma large, ovoid-globose, ridged. *Fruit* unknown.

SINGAPORE: in the Bot. Garden Jungle; Ridley 2859.

4. *CANTHIUM CONFERTUM*, Korth. in Ned. Kruidk. Arch. II, 235. A shrub? everywhere glabrous; young branches rather thicker than a crow-quill, pale brown and striate when dry. *Leaves* coriaceous, olivaceous when dry, elliptic or elliptic-lanceolate, shortly and bluntly acuminate, the base narrowing into the petiole; both surfaces dull, the reticulations obsolete; main-nerves 3 (rarely 4) pairs, oblique, ascending, scrobiculate at the axils, rather faint on both surfaces; length 2.5 to 4 in.; breadth 1.25 to 1.75 in.; petioles about 3 in., winged in the upper half; stipules triangular, acuminate, much shorter than the petioles. *Cymes* sessile, shorter than the petioles, the very short axis bearing a few minute bracts and 6 or 8 flowers on pedicels .1 in. long. *Flowers* .25 in. long. *Calyx* very short and cupular, with 5 often minute teeth. *Corolla* coriaceous, rotate, the tube very short: the 5 lobes broadly triangular with thickened edges, reflexed, villous inside and bearing between the lobes 5 ovate exserted anthers on short filaments. *Style* .1 in. long, bearing a large capitate-peltate corrugated stigma. *Disk* large, thick, cushion-like. *Fruit* solitary, on a thin peduncle .15 in. long, compressed, obovate, smooth, cushion-like, glabrous. Hook. fil. Fl. Br.

Ind. III, 133. *C. glomerulatum*, Miq. Fl. Ind. Bat. Suppl. 585. *Memecylon pauciflorum*, Wall. Cat. 4114.

MALACCA: *Griffith* (K.D.) 2973; *Maingay* (K. D.) 862, 942. PENANG: *Wallich*, *Curtis* 1119, 694. SINGAPORE: *Ridley* 302, 358, 1895, 4124, 4893, 9421, 9518, 9857. JOHORE: *King and Hullett*. PAHANG: *Ridley* 2245. PERAK: *Scortechini*.

5. *CANTHIUM GLABRUM*, Blume Bijdr. 967. A small unarmed tree: young branches thinner than a goose-quill, 4-angled, pale-brown when dry, glabrous. *Leaves* thickly membranous or sub-coriaceous, elliptic or ovate-elliptic, olivaceous and dull when dry, shortly and rather abruptly acuminate, the base slightly and abruptly narrowed, or broad and rounded; upper surface glabrous, the lower with some white sub-adpressed hairs, especially by the sides of the stout midrib and larger nerves; main-nerves 6 to 8 pairs, spreading, slightly curved, inconspicuous on the upper and only slightly conspicuous on the lower surface; length 5 to 7 in.; breadth 2 to 3 in.; petiole 4 to 6 in. *Stipules* broadly triangular at the base, much acuminate, shorter than the petioles. *Cymes* many-flowered, about 1 in. in diam., on short peduncles, dichotomously branched. *Flowers* pentamerous, .15 in. long, their pedicels slightly shorter. *Calyx* shortly campanulate or cupular, the mouth undulate and with 5 small triangular teeth. *Corolla* widely tubular, constricted at the throat, the limb with 5 deep valvate broadly lanceolate acute spreading or reflexed lobes. *Anthers* ovate, on short filaments in the throat, with a line of vertically deflexed stout white hairs just below them. *Stigma* large, sub-globular, rather turbinate, corrugated. *Ovary* 5-celled. *Fruit* ellipsoid, pulpy, 4-angled (when dry) often compressed, smooth outside, the two enclosed pyrenes triangular, the inner face of each being flat, the outer faces deeply grooved so as to leave a bold central keel. DC. Prod. IV, 478: Hook. fil. Fl. Br. Ind. III, 133. *Plectronia glabra*, Kurz For. Fl. II, 35. *Vangueria? atroviridis*, Wall. Cat. 8412. *Rubiacea*, Wall. Cat. 8303.

In all the provinces: common.

This species is easily distinguished from *C. didymum* by its short widely tubular corolla slightly constricted just below the limb, that of *C. didymum* being hypocrateriform with a narrow tube. The fruit of this is also large and quite glabrous.

6. *CANTHIUM DIDYMU*M, Gaertn. fil. Fruct. III, 94. A tree: young branches without spines, nearly as thick as a goose-quill, 4-angled, at first brown, but afterwards pale, smooth, the nodes thickened. *Leaves* thinly coriaceous, glabrous, narrowly elliptic or ovate-lanceolate, occasionally sub-orbicular, the apices sub-acute, acute or shortly and bluntly acuminate, usually much narrowed at the base, but sometimes rounded; upper surface dark-brown when dry, shining, the lower paler: main-nerves 3 to 5 pairs, slightly curved, ascending, thin but prominent on



the lower surface as is the midrib, faint on the upper; length 2·5 to 6 in.; breadth 1·5 to 3·5 in.; petioles ·25 to ·3 in.; stipules ·25 in. long, triangular, with broad base and narrowly acuminate apex. *Cymes* subsessile or on short peduncles (·25 to 1 in. long) sometimes puberulous; branches longer than the peduncles, spreading, corymbose, crowded, many-flowered. *Flowers* about ·25 in. long, on unequal slender pedicels. *Calyx* less than ·1 in. long, narrowly campanulate; mouth with short acute teeth or truncate. *Corolla* salver-shaped, the throat villous: the mouth with 5 blunt oblong deflexed lobes as long as or longer than the tube. *Anthers* narrowly oblong, on filaments half their length, inserted on the throat, exerted and deflexed. *Style* glabrous; stigma subquadrate, notched or bifid. *Fruit* variable, always compressed and more or less didymous, usually somewhat obovoid or obovoid-ellipsoid, ·25 to ·6 in. long, minutely velvety: pyrenes with hard dark warted putamen. Roxb. Fl. Ind. I, 535: W. & A. Prodr. 425; DC. Prod. IV, 473; Wall. Cat. 8413; Hook fil. Fl. Br. Ind. III, 132; Trimen Fl. Ceyl. II, 343. *Plectronia didyma*, Kurz For. Flor. Burma. II, 35. *Psydrax dicoccos*, Gaertn. Fruct. p. 125, t. ·26; DC. Prod. IV, 476. *Vangueria dicocca* Miq. Fl. Ind. Bat., II 250. *Webera cymosa*, Willd. Sp. p. 1224. *Indeterm.* Wall. Cat. 9069.

In all the provinces, very common.

The South Indian species *C. umbellatum*, Wight, Ic. 1034 is, in my opinion, only a form of this species.

#### *Doubtful Species.*

7. *CANTHIUM GRISEUM*, King & Gamble. A shrub? Young branches nearly as thick as a goose-quill, striate and purplish-brown when dry. *Leaves* membranous, narrowly elliptic, tapering to each end; upper surface dark, sparsely strigose when young, afterwards glabrous; lower surface cinereous with pale curved hairs, especially on the midrib and 4 or 5 pairs of rather prominent little-curved ascending main-nerves; length (when young) 2 to 2·5 in.; breadth ·75 to 1·25 in.; petioles ·2 to ·25 in.; stipules broadly triangular, acute, much shorter than the petioles. *Flowers* ·2 in. long, pedicellate, crowded on short multi-bracteolate axillary branches longer than the petioles, the pedicels ·15 to ·2 in. long; pubescent. *Calyx* one-third the length of the corolla, rotate, with 5 long narrow spreading lobes. *Corolla* much pointed in bud, with a short wide tube puberulous outside but densely hairy inside; the 5 lobes about as long as the tube, triangular, acuminate, sub-erect. *Anthers* sub-sessile in the tube, included, elliptic. *Stigma* large, globose, ribbed. *Fruit* unknown.

LANKAWI; *Curtis* 2804.

Only once collected. Has a strong superficial resemblance to *Vangueria spinosa* Roxb.

## 36. MESOPTERA, Hook fil.

A tree with stout terete branches and large, very coriaceous leaves: stipules large, coriaceous, unequal. *Flowers* minute, in dense ebracteolate axillary cymes shorter than the petioles. *Calyx-tube* short, hemispheric, 5-toothed. *Corolla-tube* short; throat hairy; lobes of the limb short, acute, valvate in bud. *Stamens* 5, inserted on the throat; filaments short, subulate; anthers oblong, apiculate. *Ovary* 2-celled: style short, stout; stigma capitate, 10-lobed: ovules 1 in each cell, attached to the septum. *Fruit* small, 2-celled and didymous, or 1-celled and globose, smooth: pericarp coriaceous, with a thin fleshy covering. *Seeds* cup-shaped, embracing a thick horny projection from the inner angle of the cell; testa adnate to the fleshy albumen: embryo slender, cylindric, coiled in the middle of the albumen; cotyledons short, obtuse; radicle long, superior.—A single Malayan species.

MESOPTERA MAINGAYI, Hook fil. in Benth. & Hook. fil. Gen. Plantar. II. 131; Fl. Brit. Ind. III, 137. Young branches as thick as a goose-quill, deciduously rusty-tomentose. *Leaves* elliptic or broadly ovate; shortly acuminate, smooth and shining on the upper surface, rusty-tomentose on the lower; main-nerves 5 to 7 pairs, curved, ascending, depressed on the upper, bold and prominent on the lower surface; length 7 to 9 in.; breadth 4·5 to 5·5 in. *Stipules* very unequal and obtuse, with strong parallel nerves, one obliquely oblong, 1 in. in length, the other shorter and rounded; petiole 5 in. long, very stout. *Cymes* less than 5 in. in diam. in flower, but in fruit 2·25 in. in diam. and much branched, pubescent. *Fruit* when didymous 2 to 2·25 in. across; when single-seeded and globular about half as much.

MALACCA: *Māingay* (K.D.) 939.

Known only from Maingay's two specimens in Herb. Kew. The above description is mainly copied from Sir Joseph Hooker's.

## 37. GARDENIOPSIS, Miq.

Shrubby or sub-arboreous, glabrous, with stout branches. *Leaves* very coriaceous, oblanceolate, many-nerved; stipules lanceolate, caducous. *Flowers* in small somewhat supra-axillary clusters without bracts or bracteoles. *Calyx* small, its tube cylindric; the limb with 5 spreading lobes. *Corolla* much larger than the calyx (1 in. or more in length); its tube widely cylindric, less than half as long as the limb; lobes of limb large, ovate, imbricate. *Stamens* 5, inserted near the base of the corolla-tube; the anthers linear, acuminate, included. *Style* short, stigma fusiform acute; ovary 2-celled with 1 ovule in each cell. *Fruit* broadly ovoid, rugulose, with 10 broad bold ridges, its sub-truncate apex



surrounded by the enlarged thickened incurved calyx-lobes, 2-celled, 2-seeded. **DISTRIB.**—One or perhaps two species, both Malayan.

**GARDENIOPSIS LONGIFOLIA**, Miq. in Ann. Mus. Lugd. Bat. IV. 250 and 262. A small tree 10 or 12 feet high: young branches as thick as a goose-quill, pale-brown. *Leaves* coriaceous, oblanceolate, gradually narrowed, in their lower three-fourths, to the stout petiole; main-nerves 15 to 20 pairs, slightly curved upwards and interarching  $\cdot 1$  in. from the slightly recurved edges, the intermediate nerves are numerous but fainter, all prominent on the lower surface and depressed on the upper; both surfaces yellowish-brown, the lower paler and reticulate, length 6 to 16 in.; breadth  $1\cdot 5$  to  $3\cdot 5$  in.; petioles  $\cdot 3$  to  $\cdot 5$  in. long; stipules narrowly lanceolate, acuminate,  $\cdot 4$  to  $\cdot 5$  in. long. *Flowers* sessile in clusters of 5 or 6; the calyx-tube about  $\cdot 1$  in. long: the limb about  $\cdot 15$  in. across, its lobes ovate. *Fruit*  $\cdot 4$  to  $\cdot 6$  in. long.

**MALACCA:** *Derry* 960. **PERAK:** *Scortechini* 1234; *Wray* 2832, 3693; *King's Collector* 2361, 2850, 6934; *Ridley* 9722. **PAHANG:** *Ridley* 2661. **NEGRI SEMBILAN:** *Ridley* 10081. **DISTRIB.**—Sumatra.

There is what appears to be a distinct species of this in Borneo (*Haviland* 3011) with longer narrower calyx-lobes and fruit  $1\cdot 25$  in. long.

### 38. WEBERA, Schreber.

Trees or shrubs with thin coriaceous or membranous leaves drying black. *Flowers* in terminal paniculate cymes, usually on bi-bracteolate pedicels. *Calyx-tube* campanulate or urceolate, the limb 5-toothed or 5-partite. *Corolla* cylindrical or narrowly funnel-shaped; its tube shorter, equal to or longer than the lobes of the limb; throat glabrous or with a line of hairs; limb 5-lobed, narrowly oblong, spreading or reflexed, twisted in bud. *Stamens* 5, linear, inserted by short filaments on the throat. *Style* short, usually pubescent; *stigma* long, spindle-shaped or ligulate, grooved, exserted. *Ovary* 2-celled, each cell with a single or at most with 2 ovules. *Fruit* baccate, with little pulp, 2-celled; each cell with a single plano-convex seed often cupped on the plane surface: testa various, albumen fleshy or horny; embryo small, cotyledons leafy. **DISTRIB.**—About 20 species, all tropical.

The genus *Webera*, as understood in Hooker's *Flora of British India*, is composed of two sets of plants, one with 2 or more ovules in each cell of the ovary, the other with only a single ovule in each. The former are, in that work, formed into the section *Euwebera*. In these *Materials* the same plants are described under the genus *Stylocoryna* of Cavanilles. By other authors they have been treated as a genus either under the name of *Tarenna*, Gaertner or of *Chomelia*, Linn. (not of Jacquin and Velloso). The species with single ovules in each cell are, in the *Flora of British India*, grouped in a section named *Pseudixora*. Here they are treated under the generic name *Webera*. The two sections, *Euwebera* and *Pseudixora*, are

thus, on account of their ovulation, removed to distant positions in the family of *Rubiaceæ*.

Lobes of the corolla longer than its tube:—

Apices of the corolla-lobes acuminate, reflexed in bud and forming a stem at the apex of the flower-bud: fruit ovoid ... .. 1. *W. stellulata*.

Apices of the corolla-lobes not linear or reflexed in bud; fruit globular:—

Lobes of corolla with ciliate margins; calyx .25 in. long, its lobes large, oblong-lanceolate, acuminate ... .. 2. *W. Ridleyi*.

Lobes of corolla glabrous; calyx .15 in. long, its lobes broadly triangular, acute:—

Leaves 5 to 8 in. long, with 8 to 10 pairs of nerves ... .. 3. *W. Wallichii*.

Leaves 2.5 to 3.5 in. long, with 5 or 6 pairs of nerves ... .. 4. *W. Curtisii*.

Lobes of the corolla and its tube of equal length ... 5. *W. odorata*.

Lobes of the corolla shorter than its tube:—

Cymes trichotomously panicled, on peduncles several inches in length:—

Calyx a little over .1 in. long, the limb with 5 short blunt teeth; leaves glabrous with 8 to 10 pairs of nerves ... .. 6. *W. grandifolia*.

Calyx .15 in. long, the limb with 5 deeply linear lobes as long as its tube; leaves puberulous beneath, with 8 to 16 pairs of nerves ... .. 7. *W. longifolia*.

Cymes condensed, with very short peduncles:—

Leaves glabrous and with 16 to 18 pairs of sub-horizontal nerves; lobes of calyx linear-lanceolate, longer than the tube ... .. 8. *W. Wrayi*.

Leaves with scattered adpressed hairs on the under surface, especially on the midrib and 8 to 10 pairs of nerves; lobes of calyx less than half as long as its tube, triangular, sub-acute ... 9. *W. Yappii*.

1. **WEBERA STELLULATA**, Hook. fil. Fl. Br. Ind. III. 104. A shrub: young branches much thinner than a goose-quill, dark-coloured, subterete, glabrous. *Leaves* thinly coriaceous, oblong-elliptic to elliptic, shortly acuminate at the apex, cuneate at the base, upper surface glabrous, shining, very dark when dry, the midrib and nerves depressed; the lower paler and dull, sometimes puberulous when young, but usually glabrous; main-nerves 7 to 10 pairs, rather faint, curved, ascending: length 4.5 to 9 in.; breadth 1.5 to 2.5 in.; petiole .25 to .4 in.; stipules ovate, acuminate, .15 in. long. *Cymes* (including the short peduncle) 1 to 1.5 in. long, terminal, solitary, at first puberulous, afterwards glabrous, trichotomous, rather few-flowered; the bracteoles

linear-lanceolate, persistent. *Flower-pedicels* shorter than the calyx, bracteolate. *Calyx* about .15 in. long, narrowly campanulate, cut about half-way down into 5 acute triangular lobes. *Corolla* .4 in. long; the tube cylindric, only .1 in. long; the limb .3 in. long, its lobes imbricate, oblong, acuminate with free reflexed linear points; throat slightly hairy. *Anthers* linear, acuminate, on short filaments, included. *Ovary* with two 1-ovuled cells; *style* much shorter than the fusiform hairy included stigma. *Fruit* broadly ovoid or sub-globular, crowned by the calyx-lobes, glabrous, 4 in. long. *Seeds* 2. *Stylocoryne Webera*, Wall. Cat. 840 I (*in part*). *Pavetta aristata*, Wall. Cat. 6169.

PENANG: *Wallich*. MALACCA: *Griffith* (K.D.) 3086; *Maingay* (K.D.) 850. SELANGOR: *Ridley*, 10220. PERAK: *King's Collector*, 973, 4309, 5951, 6169, 10228; *Wray*, 458, 1094, 3745.

Some of the specimens of this have the leaves of a pale olivaceous-brown colour (when dry), contrasting in this respect strongly in colour with the majority which are very dark. The species is well-marked by its corolla, the tube of which is only one-quarter as long as the oblong lobes of the limb, while the five linear points of the latter are reflexed and form a kind of star at the apex of the flower-buds. The lobes do not appear to expand, for in all the specimens I have seen they remain convolute.

2. WEBERA RIDLEYI H.H.W. Pearson MSS. in Herb. Kew. A low glabrous shrub; young branches pale-brown, obtusely 4-angled. *Leaves* thin coriaceous, narrowly elliptic, acute or shortly acuminate, the base cuneate; both surfaces olivaceous-brown, shining (especially the upper) when dry, main-nerves 10 to 14 pairs, curved, spreading, faint but distinct on both surfaces; length 5.5 to 7 in.; breadth 2 to 3 in.; petioles .4 to .7 in.; stipules broadly triangular, acute, about .2 in. long. *Cymes* several together, terminal, in short pedicels, trichotomous, few-flowered; the branchlets angled and with a few permanent boat-shaped acute bracteoles. *Flower* pedicels about as long as the calyx, bibracteolate near the apex. *Calyx* .25 to .3 in. long, campanulate, the limb as long as the tube, deeply divided into 5 oblong-lanceolate acuminate lobes. *Corolla* not much longer than the calyx; the tube short; the limb three times longer and deeply divided into 5 oblong, acute, contorted lobes with ciliate margins. *Anthers* 5, inserted on the throat in a band of hair. *Ovary* with two uni-ovulate cells; *style* very short: stigma fusiform, sulcate, glabrous. *Fruit* fusiform, glabrous, the calyx-scar apiculate.

SINGAPORE: at Chan Chu Kang, *Ridley*, 6147. JOHORE: *King*, 602, PERAK: *King's Collector*, 4585, 4615.

Only once collected and not in fruit; flowers white. A species near *W. Wallichii* but with longer corolla lobes ciliate at the margin.



3. *WEBERA WALLICHII*, Hook fil. Fl. Br. Ind. III, 105. A shrub 4 to 8 feet high, glabrous except the branches of the inflorescence and the calyx: young branches thinner than a goose-quill, usually dark-coloured, obscurely 4-angled. *Leaves* membranous, oblong-elliptic, oblong, or elliptic, rarely oblanceolate, the apex shortly acuminate, the base cuneate; both surfaces more or less darkly olivaceous when dry, the midrib rather bold; main-nerves 8 to 10 pairs, slightly curved, ascending, thin and only slightly prominent; length 5 to 8 in.; breadth 2 to 2.75 in., petiole .4 to .6 in. *Stipules* broadly triangular, acuminate, .25 in. long. *Panicles* terminal, much branched, shortly pedunculate, about 1.25 to 2.5 in. long including the peduncle, and equally broad branches and their divisions puberulous, cymose; bracteoles triangular acute, about 1 in. long. *Flowers* .4 to .6 in. long, on compressed pedicels longer than the calyx. *Calyx* .15 in. long, bracteolate (often bibracteolate) at the base, shortly campanulate, with 5 broadly triangular acute teeth, puberulous externally. *Corolla* .45 in. long, glabrous, salver-shaped, the short tube with a belt of hair inside: the lobes linear-lanceolate, longer than the tube, reflexed. *Anthers* 5, exserted, linear-oblong, the apex sub-acute, the base blunt and prolonged beyond the attachment to the short filament. *Style* cylindrical, hairy in the middle: stigma as long as the style, compressed, exserted. *Fruit* fusiform, glabrous, reticulate when dry, shining, not ridged, crowned by the small calyx, .4 in. long and .3 in. in diam. *Seeds* 2. *Stylocoryne Webera*, Wall. Cat. 840, I (for the most part). *Pavetta weberæfolia*, Wall. Cat. 6182 A, in part B.

MALACCA: *Griffith* (K.D.) 3084, 3004; *Maingay* (K.D.) 851.  
PERAK: *Wray*, 3745; *King's Collector*, 1932, 2516, 2921, 2794, 5032, 5957, 10228; *Scortechini*, 429.

4. *WEBERA CURTISII*, King, n. sp. A small shrub; all parts glabrous except the cinereous-puberulous inflorescence. *Leaves* coriaceous, narrowly elliptic, shortly acuminate, the base cuneate; both surfaces drying dark olivaceous-brown, the lower paler; main-nerves 5 or 6 pairs, rather straight, ascending: length 2.5 to 3.5 in.; breadth .9 to 1.35 in. petiole .15 to .3 in.; stipules ovate or ovate-lanceolate, much acuminate. *Cymes* terminal, sub-sessile, only about 1 in. in diam. each way, trichotomous, few-flowered, the short branches and the flower-pedicels cinereous-puberulous, angled; pedicels slightly longer than the calyx; *Calyx* .1 in. long, campanulate; the limb with 5 acute triangular erect lobes. *Corolla-tube* widely cylindrical, not much exceeding the calyx, and about one-third of the length of the 5 imbricate, oblong, blunt, reflexed lobes of the limb. *Style* shorter than the lobes of the limb, but exserted on account of their reflexion; clavate, grooved. *Ovary* 2-celled: cells each with a single ovule. *Fruit* globular, crowned by the small

calyx-scar, glabrous, .2 in. in diam. when dry. *Seeds* 2, plano-convex, the plane surface with a large pit.

KEDAH: *Curtis*, 2545, 2546. LANGKAWI: *Curtis*, 2805. PERAK: *Wray*, 3612.

5. WEBBERA ODORATA Roxb., Hort. Beng. 15: Fl. Ind. I, 699. A short shrub 6 to 10 feet high; young branches cinereous, sub-terete, *Leaves* membranous oblong-elliptic (often narrowly so), shortly acuminate, the base much narrowed; both surfaces dull, glabrous, the lower pubescent in *var.*, deep olivaceous when dry: main-nerves 8 or 9 pairs, faint, little curved, ascending or spreading, length 5 to 8 in.; breadth 1.5 to 3 in.; petiole .4 to .8 in.; stipules triangular, acuminate, much shorter than the petioles. *Cymes* large terminal, paniculate, trichotomous, lax, 5 or 6 inches wide and equally long, spreading; the peduncles and branches long and slender, 4-angled, cinereous-pubescent: bracteoles linear, persistent. *Flower-pedicels* as long as or longer than the flowers, pubescent. *Calyx* urceolate-campanulate, about .1 in. long; the teeth shorter than the tube, lanceolate. *Corolla-tube* slender, cylindrical, .25 in. long, the lobes imbricate, clavate in bud, about the same length, narrowly oblong, acute, sub-falcate, reflexed, their upper surfaces glabrous. *Ovary* 2-celled, each cell with 2 ovules; *stigma* exserted, clavate-subulate. *Fruit* the size of a large pea, 2-celled, 2-seeded. Hook. fil. Fl. Br. Ind. III, 102. *W. macrophylla*, Roxb. l.c. 697. *Pavetta weberæfolia*, Br. in Wall. Cat. 6182 A, in part. *P. cerberæfolia*, Miq. Fl. Ind. Bat. II, 279. *Stylocoryne Webera* Wall. Cat. 8401. *S. penangensis*, Miq. l.c. 207. *Cupia macrophylla* DC. Prod. IV, 394.

PENANG: *Wallich*. PERAK: *King's Collector* 3121, 3807, 4236; *Wray* 1147.

VAR. *pubescens*, King; lower surfaces of leaves pubescent.

PERAK: at 3400 feet: *Wray*, 474.

6. WEBBERA GRANDIFOLIA, Hook. fil. Fl. Br. Ind. III. 105. A shrub or small tree: young panicles obtusely 4-angled, deciduously and minutely rusty-pubescent. *Leaves* thinly coriaceous, elliptic to elliptic-oblong or oblong-oblancoelate, shortly and often abruptly acuminate, much narrowed at the base: both surfaces (when dry) brown, tinged with olivaceous, the lower slightly the paler, quite glabrous; main-nerves 8 to 12 (rarely as many as 16) pairs, thin but distinct on both surfaces, spreading, curved: length 5 to 10 (rarely 12) in.; breadth 2 to 4 in.; petiole .4 to .75 in.; stipules broadly ovate, shortly acuminate, .2 to .3 in. long. *Cymes* as in *W. longifolia*, but on shorter peduncles and with fewer bracteoles. *Calyx* slightly more than .1 in. long, flask-shaped, the limb with 5 short blunt teeth. *Flowers* as in *W. longifolia*, but slightly



shorter, and more obovate in bud; fruit as in *W. longifolia*. *Ixora grandifolia*, Br. in Wall. Cat. 6134.

MALACCA: Griffith (K.D.) 2796; Maingay (K.D.) 854. SINGAPORE; Wallich; Ridley 1800, 3764, 10411, 10852. PERAK: Wray 3001, 3377; Ridley 5557; King's Collector 763. JOHORE: Ridley, 11167.

7. *WEBERA LONGIFOLIA*, Hook. fil. Fl. Br. Ind. III, 105. A shrub, young branches thinner than a goose-quill, obtusely 4-angled, deciduously rusty-puberulous. Leaves thinly coriaceous, oblanceolate, elliptic-oblong or elliptic-lanceolate, shortly acuminate, narrowed from the middle or above it to the short petiole; both surfaces drying olivaceous-brown; the upper glabrous and shining, the lower deciduously cinereous-puberulous, main-nerves 8 to 16 pairs, spreading, slightly prominent on the lower surface, faint on the upper, length 6 to 12 in.: breadth 2 to 3 in.: petiole .4 to 1 in.; stipules ovate, much acuminate, hairy, about .3 in. long. Cymes erect, terminal, paniculate, trichotomous, on rusty-pubescent obtusely 4-angled peduncles several inches (sometimes 9 or 10) in length: ultimate branchlets crowded: the flower-pedicels each with 2 linear bracteoles at its base. Calyx .15 in. long, narrowly campanulate, divided into 5 deep linear hairy lobes as long as the tube. Corolla pubescent, about .65 in. long; the tube cylindrical, more than twice as long as the oblong obtuse lobes. Style exerted. Ovary 2-celled, each cell with one ovule. Fruit globular, glabrous, 4 in. in diam. (when dry), crowned by the long linear calyx-lobes. *Ixora longifolia*, G. Don. Gen. Syst. III, 573. *I. macrophylla* Br. in Wall. Cat. 6165 (not of Bartl.). *Pavetta longifolia*, Miq. Fl. Ind. Bat. II, 275.

PENANG: Wallich, Phillips; Ridley, 9395; Curtis 947, 1144. PERAK: King's Collector, 2737, 3825, 6220, 6632, 10662; Wray, 2081, 2864, 2885; Scortechini, 228; Ridley, 2920. JOHORE: Ridley, 11166.

8. *WEBERA WRAYI* King, n. sp. Glabrous, except the inflorescence: young branches 4-angled, thinner than a goose-quill. Leaves thinly coriaceous, large, oblong-elliptic, shortly acuminate, cuneate at the base; both surfaces blackish-olivaceous when dry, shining, the midrib conspicuous on both, channelled on the upper; main-nerves 16 to 18 pairs, spreading, sub-horizontal, faintly visible on both surfaces; length 9 to 11 in. long; breadth 2.5 to 3.5 in.; petiole .5 in. long, narrowly winged above. Cymes terminal, umbellately paniced, about 1.25 in. long and broad; the branches few, pubescent, slender, angled, few-flowered, the bracteoles minute: pedicels shorter than the calyx, pubescent, bracteolate. Calyx .15 in. long, narrowly campanulate, the teeth linear-lanceolate, pubescent, erect, longer than the tube. Corolla narrowly funnel-shaped, puberulous outside, .35 in. long: lobes linear-oblong, blunt, about a third of the length of the tube. Stigma narrowly clavate, exerted,

glabrous. *Fruit* depressed-globular, smooth, shining, black when dry, crowned by the small calyx-scar,  $\cdot 4$  in. in diam. and  $\cdot 25$  in. long. *Seeds* 2, plano-convex with a depression on the plane side.

PERAK: *Scortechini*; *Wray*, 2477.

9. WEBERA YAPPIL, King, n. sp. Young branches thinner than a goose-quill, pale-brown when dry, glabrous. *Leaves* membranous, narrowly oblong-elliptic, acuminate, the base cuneate, both surfaces olivaceous when dry, the upper quite glabrous, the midrib slightly channelled; the lower paler, glabrous but for a few scattered adpressed pale hairs chiefly along the prominent midrib and 9 or 10 pairs of curved ascending distinct nerves: length 5 to 7 in.; breadth 1.5 to 1.75 in.; petioles  $\cdot 3$  to  $\cdot 5$  in.; stipules broadly lanceolate-oblong, blunt, shorter than the petiole. *Cyme* on a short peduncle, terminal, paniculate, condensed, about 2.5 in. in diam., its branches pubescent; bracteoles few, linear. *Flower-pedicels* about as long as the calyx. *Calyx*  $\cdot 1$  in. long, narrowly campanulate, pubescent; its 5 lobes less than half as long as the tube, triangular, sub-acute, rusty-pubescent. *Corolla-tube* narrowly infundibuliform, about  $\cdot 4$  in. long, pubescent; the 5 blunt oblong lobes of the limb imbricate in bud, reflexed where expanded, glabrous. *Style* short; stigma slightly exserted, ligulate. *Fruit* the size of a small pea, glabrous. *Seeds* 2, plano-convex.

PERAK: *Yapp*. 482; *Wray* 10.

### 39. IXORA, Linn.

Shrubs or small trees with terete branches. *Leaves* opposite, rarely in whorls of three, often coriaceous, rarely sessile. *Stipules* interpetiolar, often with broad bases and acuminate or linear apices, deciduous or persistent. *Flowers* in terminal trichotomously branched, often corymbose *cymes*, each bi-bracteolate, rarely 5-merous. *Calyx-tube* campanulate, often narrowly so; the limb 4-toothed, persistent. *Corolla* salver-shaped: the tube narrowly cylindrical much longer than the calyx, rarely widened towards the apex, the throat naked or hairy; the limb with 4, rarely 5 spreading or reflexed lobes, twisted in bud. *Stamens* as many as the corolla-lobes, and inserted on its mouth by short filaments or sessile; anthers linear or oblong usually acuminate, the base bifid, dorsifixed, erect, more or less exserted. *Ovary* 2-celled. *Style* filiform, exserted but never twice as long as the corolla-tube. *Stigma* slender, fusiform before expansion, after expansion its two arms curved and divergent; ovules solitary, peltately attached to the septum of each cell: micropyle inferior. *Fruit* globose or didymous, with 2 plano-convex or ventrally concave coriaceous pyrenes. *Seeds* of the same shape as the pyrenes; testa membranous; albumen cartilaginous;

embryo curved; cotyledons foliaceous; radicle inferior.—DISTRIB. Species about 110; mostly tropical Asiatic and African.

Lobes of the calyx as long as, or longer than, its tube:—

Leaves hairy beneath:—

Calyx-lobes narrowly lanceolate, acuminate ... 1. *I. Brunonis.*

Leaves everywhere glabrous:—

Calyx-lobes broadly lanceolate, acute, unequal ... 2. *I. merguensis.*

Calyx-lobes broad, blunt, unequal; bracts not covering the calyces ... 3. *I. Kingstoni.*

Calyx-lobes ovate, obtuse, puberulous; bracts longer than the calyces and covering them ... 4. *I. multibracteata.*

Calyx-lobes narrowly lanceolate, about as long as the tube ... 5. *I. arguta.*

Lobes of the calyx shorter than its tube:—

Lobes acute:—

Tube of corolla 1 to 1.25 in. long:—

Leaves sessile, cordate at the base, 2 to 3 in. long ... 6. *I. coccinea.*

Leaves elliptic to oblong-elliptic, not cordate, 6 to 9 in. long; their petioles .3 to .5 in. long ... 7. *I. congesta.*

Tube of the corolla .25 to .3 in. long:—

Leaves oblong-elliptic, shortly petiolate, .35 to .5 in. long; cymes with many divergent branches 8. *I. undulata.*

Lobes blunt:—

Tube of corolla 1 to 1.25 in. long:—

Cymes pendulous on long slender peduncles 9. *I. pendula.*

Cymes not pendulous; peduncles 1 to 2 in. long:—

Main-nerves of leaves 15 to 20 pairs ... 10. *I. opaca.*

Main-nerves of leaves 8 to 12 pairs ... 17. *I. grandifolia*, var. *Kurziana.*

Tube of corolla 1 to 1.75 in. long:—

Cymes lax, spreading, leaves petiolate, acute at the base; branching shrubs (often tall):—

Leaves thinly membranous, their main-nerves 15 to 25 pairs ... 11. *I. Lobbii.*

Leaves coriaceous, their main-nerves 10 to 12 pairs ... 12. *I. fulgens.*

Cymes not spreading, simple unbranched shrubs

1 or 2 feet high; leaves sessile, oblanceolate, cordate at the base:—

Main-nerves of leaves 15 to 18 pairs ... 13. *I. humilis.*

Main-nerves of leaves 8 to 10 pairs ... 14. *I. Scortechinii.*

Tube of corolla .8 in. long; cymes dense, 2 to 3 in.

in diam. ... 15. *I. stricta.*



- Tube of corolla .4 in. long; cymes lax, slightly branched, 1 to 1.5 in. long ... .. 16. *I. concinna*.  
 Tube of corolla .2 to .4 in. long:—  
 Cymes 2 to 4 in. across, branched, spreading:—  
 Leaves coriaceous; cymes branched from the base ... .. 17. *I. grandifolia*.  
 Leaves membranous; cymes on long slender naked peduncles 3 to 4 in. long ... .. 18. *I. diversifolia*.

1. *IXORA BRUNONIS*, Wall. Cat. 6136. A shrub; young branches thicker than a crow-quill, covered with short cinereous-brown tomentum. *Leaves* thinly membranous, sessile, oblanceolate, sometimes sub-panduriform, shortly caudate-acuminate, tapering much to the rounded or minutely cordate base; upper surface with the interspaces shining and glabrous, the depressed midrib and 10 to 12 pairs of rather faint curved ascending main-nerves minutely tomentose; lower surface with minute spreading pubescence especially on the prominent midrib, main-nerves and reticulations, length 5 to 10 in.; breadth 1.5 to 2.25 in.; stipules with broad ovate bases with stout midribs, and long thin linear apical tails, length (including the tails) .5 in. *Cymes* about 1.5 in. long, 12- to 20-flowered, on short tomentose peduncles, 4 to 6 collected in corymbs on the apices of the branches, their bracteoles filiform and hairy. *Flowers* sessile; calyx .15 to .2 in. long, narrowly campanulate, the 4 teeth narrowly lanceolate, acuminate, as long as the tube. *Corolla* 1 to 1.5 in. long, externally with long cinereous spreading deciduous hairs, ultimately nearly glabrous; the tube very narrowly cylindric, glabrous and ridged inside, the throat hairy: limb .5 in. across, its lobes 4, oblonge-elliptic, acute, spreading or reflexed, quite glabrous on the upper surface, sparsely hairy on the lower. *Anthers* elongate, narrow, acuminate, deflexed, longer than their filaments. *Stigma* slender, slightly exserted. *Fruit* ovoid, puberulous, .35 in. long, and .25 in. in diam. when dry. G. Don Gen. Syst. III. 573; Kurz Flora Burm. II. 20; Hook fil. Fl. Br. Ind. III. 139. *Pavetta Brunonis*, Miq. Fl. Ind. Bat. II, 270 (not of Wight Icon.)

PENANG: *Wallich*, (6136); *Phillips*; *Ridley*, 7682. PERAK: *Wray*, 3478, 3524; *King's Collector*, 1658. SINGAPORE: *Lobb*. MALACCA: *Main-gay* (K.D.) 858. DISTRIB. Burma; *Wall. Cat.* 8447.

2. *IXORA MERGUENSIS*, Hook fil. Fl. Br. Ind. III. 140. A robust shrub only 2 or 3 feet high, glabrous; stem as thick as a swan's-quill, compressed, cinereous. *Leaves* large, coriaceous, elliptic-oblong or obovate, abruptly and shortly acuminate, the base very cuneate: both surfaces olivaceous and dull; when dry the lower paler and reticulate; main-nerves 10 to 14 pairs, slender, slightly curving upwards; length 7 to 12 in.; breadth 2.25 to 4 in.; petioles .5 to 1 in., stout, channelled. *Cymes*



globose, sub-sessile, terminal, with numerous very short branches, about 3 in. in diam., dense, many-flowered, pedicellate, each flower with a lanceolate small bract. *Calyx* .15 in. long, campanulate, the 4 lobes of the limb unequal, broadly lanceolate, acute, somewhat longer than the tube. *Corolla-tube* puberulous, .6 in. long, cylindrical, narrow below, somewhat wider above; the limb .6 in. across; its lobes oblong, broad, blunt, spreading, the throat with a few hairs. *Anthers* sub-sessile, narrow, apiculate. *Fruit* unknown.

MALAY PENINSULA: *Griffith* (K.D.) 3003. PUNGAH: *Curtis*, 2961. PERAK: *Wray*, 3543?

Mr. Curtis has sent from Pungah two specimens bearing the number 2961, one in Herb. Kew and the other in Herb. Calcutta. The one in Herb. Calcutta is typical *I. merguensis*; that in Kew forms the variety described below.

VAR. *Curtisii*, King & Gamble; *leaves* narrowly elliptic-oblong, not at all obovate; nerves about 14 pairs, curving upwards, distinct on both surfaces; length 14 in.; breadth 4.25. *Corolla-tube* about .8 in. long, cylindrical, widening upwards, puberulous; its limb nearly 1 in. across; the lobes ovate-lanceolate, sub-acute, the throat hairy.

PUNGAH: *Curtis*, 2961.

3. IXORA KINGSTON, Hook. fil. Fl. Br. Ind. III, 140. A shrub or small tree: young branches as thick as a duck's quill, terete, smooth and dark-coloured when dry. *Leaves* thinly membranous, shining and of a pale warm-brown colour when dry; glabrous, oblong or elliptic-oblong, sometimes oblanceolate, the apex with a short usually blunt point, tapered from below the middle to the short petiole; the reticulations slender; main-nerves 15 to 18 pairs, slender, spreading; length 5 to 9 in.; breadth 2 to 3 in.: petiole .4 to .5 in. channelled; stipules semilunar, broad but only about .1 to .15 in. long, the apex bearing a short bristle. *Cymes* 4 to 6, in a dense terminal corymbose panicle 3 or 4 in. in diam., each on a puberulous bracteate peduncle about .5 in. long (longer in fruit) and bearing numerous bibracteolate flowers, the bracts and pairs of bracteoles ovate-lanceolate, subcoriaceous, sub-acute, more or less persistent. *Flowers* 4-merous, sessile, crowded. *Calyx* .2 to .3 in. long; the tube short, narrow; the limb with 4 large deep broad blunt lobes longer than the tube, one usually longer than the other 3 and resembling the bracts and bracteoles in texture. *Corolla-tube* 1 to 1.25 in. long, slender, cylindrical, glabrous; the limb .5 to .6 in. across, the lobes broadly obovate, obtuse, spreading. *Anthers* narrow, apiculate, reflexed, longer than their filaments. *Stigma* slightly exserted, small. *Fruit* ovoid, puberulous, crowned by the persistent calyx-lobes; length (including calyx-lobes) .7 in.: diameter .3 to .4 in. (when dry).

MALACCA: *Griffith* (K.D.) 2996; *Goodenough*, 1271. PERAK: *Scortechini*, 2030; *Wray*, 626; *King's Collector*, 733, 871, 920, 932, 2540, 3167, 4200, 5972. SELANGOR: *Ridley*, 3674, 7300; *Curtis*, 2346. JOHORE: *Curtis*.—DISTRIB. Andaman Islands.

The corolla, according to *Kunstler*, is yellowish-red. The Andamanese specimens look slightly different, and may belong to a new species. Fruit of the Andaman plant is wanting.

4. *IXORA MULTIBRACTEATA*, H. H. W. Pearson in *Kew Bull.* ed. A bush or small tree, all parts glabrous except the inflorescence; young branches thinner than a goose-quill, somewhat compressed, pale when dry. *Leaves* membranous, pale yellowish-green when dry, oblong-ob lanceolate to oblong-elliptic, shortly and bluntly acuminate, much narrowed to the base; both surfaces finely reticulate, main-nerves 10 to 16 pairs, slightly curved, spreading, faint on both surfaces; length 5 to 9 in.; breadth 1.5 to 3 in.; petiole .3 to .6 in.; stipules cupular, only about .1 to .15 in. long, shortly apiculate. *Cymes* axillary and terminal, from 2.5 to 5 in. in diam. with many spreading ridged glabrous branches, and a peduncle less than 1 in. long; bracts at the bases of the branchlets broad, blunt, from .2 to .3 in. long; ultimate branchlets with numerous imbricate ovate-triangular sub-cordate obtuse puberulous 1-nerved bracts .2 in. long at their bases, and 3 to 5 flowers nearly 1.5 in. in length; flower bracteoles ovate-obtuse, nerved, about .15 in. long. *Calyx* sessile, about .25 in. long, puberulous, its lobes 4, ovate, obtuse. *Corolla-tube* puberulous outside, glabrous within, narrowly cylindrical, 1 in. to 1.25 in. long: its limb nearly .5 in. across: the 4 lobes oblong, blunt, glabrous. *Anthers* longer than the very short filaments, narrowly oblong, short, apiculate, the base sagittate. *Fruit* unknown.

MALACCA: *Maingay* (K. D.) 856. PUNGAH: *Curtis* 2954. LANKAWI; *Curtis* 3408. ANDAMANS: *Helper* (K. D.) 2997. PERAK: *Scortechini*; *Wray* 3317. QUEDAH: *Ridley* 5540.

A species allied to *I. Kingstoni*, Hook. fil., but with less membranous leaves. It is readily distinguished by the numerous bracteoles at the bases of the flowers and by the large imbricate bracts at the bases of the ultimate branchlets.

5. *IXORA ARGUTA*, Br. in *Wall Cat.* 6157. A tree; all parts except the inflorescence glabrous; young branches much thinner than a goose-quill, obtusely 4-angled, glabrous, dark-coloured. *Leaves* thinly coriaceous, broadly oblanceolate, rarely obovate or elliptic, rather abruptly and shortly acuminate, the base much narrowed, both surfaces drying very dark-brown, almost concolorous, shining; main-nerves 6 or 7 pairs, curved, spreading, faint on both surfaces; length 3.5 to 6 in.; breadth 1.5 to 2.25 in.; petiole .2 to .4 in.; stipules lanceolate, linear-acuminate,

shorter than the petiole. *Cymes* solitary, terminal on peduncles 1·9 to 3 in. long, spreading, trichotomous, many-flowered, the bracteoles linear, persistent. *Flower-pedicels* shorter than the narrowly campanulate calyx. *Calyx* less than ·1 in. long, narrowly campanulate, its 4 or 5 narrowly lanceolate acute teeth as long as the tube, erect. *Corolla-tube* narrowly cylindric, ·4 or ·5 in. long: the limb with 5 oblong apiculate lobes ·2 in. long. *Stigma* narrowly fusiform (before the expansion of its lobes), slightly exserted. *Fruit* like a small pea if one-seeded; broader and with two vertical grooves if two-seeded, crowned by the small scar of the calyx, glabrous, smooth. *I. nigricans*, Hook. fil. Fl. Br. Ind. III. 149, VAR. *arguta*. *I. nigricans*, Wall. Cat. 6154 B. and C. only.

PERAK: *Wray* 2135, *Curtis* 1303, 980; *Kings Collector* 684, 870, 2072, 4286, 4573, 4966, 8718, 10269, 10658, 10901; *Scortechini*. KEDAH: *Ridley* 8299. SELANGOR: *Ridley* 8240. WELLESLEY: *Ridley* 7013; *Curtis*, 2451, 3206. MALACCA: *Maingay* (K.D.) 859.

The type specimens of this in the Wallichian Catalogue consist of two sheets distinguished by the letters A and B. The former was received from Herb. Heyne, and is therefore supposed to have come from Southern India. Sheet B is attributed to Penang. What appears to be the same plant but with somewhat broader leaves also forms B and C of No. 6154 which was distributed under the name *I. nigricans*, R. Br. Under this name (*I. nigricans*, R. Br.) there were unfortunately issued by Wallich two other plants lettered respectively 6154 A and D. These two not only differ from B and C, but also from each other. The name has however been adopted in the Flora of British India and the Wallichian No. 6154, without distinction of letters, has been taken as its basis. As the simplest solution of the confusion which has thus arisen, I have ventured to restore the MSS. name *I. arguta*, R. Br. for the plant—a common one in all the provinces—above described.

6. *IXORA COCCINEA* Linn. Sp. Pl. 159 (excl. syn.) A much branched shrub, the smaller branches of the cymes and the calyces puberulous, otherwise quite glabrous; young branches thinner than a goose-quill, pale. *Leaves* coriaceous, pale when dry, broadly ovate or elliptic, sessile, the base cordate and stem-clasping or slightly narrowed; the apices sub-acute or blunt and mucronate; nervation indistinct when dry; length 2 to 3 in.; breadth 1·25 to 1·75 in.; stipules narrowly semilunar with long straight linear stiff apices. *Cymes* several together, at the apices of the branches, each on a short peduncle, minutely bracteate and bracteolate; *calyx* less than ·1 in. long, puberulous cylindric, with 4 acute teeth shorter than the tube. *Corolla-tube* 1·25 to 1·5 in. long, narrowly cylindric; the 4 lobes of the limb broad, acute, spreading, ·25 in. long. *Fruit* fusiform, sometimes pulpy. Roxb. Fl. Ind. I, 375; W. & A. Prod. Fl. Pen. Ind. 427; Wight Icon. 153; Brand. For. Flora 275; Kurz. For. Flora, Burma II, 26; Hook. fil. Fl. Br. Ind.



III, 145. *I. grandiflora*, Br. in Bot. Reg. t. 154; DC. Prod. IV, 486. Wight in Hook. Bot. Misc. III. Suppl. t. 35. *I. propinqua*, Br. in Wall. Cat. 6119. *I. incarnata*, DC. Prod. l.c. *I. obovata*, Heyne in Roth Nov. Spec. 90. *I. Bandhuca*, Roxb. Hort. Beng. 10; Fl. Ind. I. 376; Wall. Cat. 6120; DC. Prod. l.c.; Wight Ic. 149. *Pavetta coccinea* and *P. incarnata*, Blume Bijdr. 950. *P. Bandhuca*, Miq. Fl. Ind. Bat. II, 266.

In most of the provinces; cultivated on account of its brilliant scarlet flowers.

7. *IXORA CONGESTA*, Roxb. Fl. Ind. I 387. A shrub, glabrous except the smaller branches of the cymes; young branches half as thick as a goose-quill, dark-coloured. *Leaves* thinly coriaceous, elliptic to oblong, elliptic, sub-acute or shortly and bluntly acuminate, the base rounded or cuneate; both surfaces brown when dry and rather dull, the lower paler; main-nerves 12 to 20 pairs, spreading and interarching at the tips, depressed on the upper and prominent on the lower surface; length 6 to 9 in.; breadth 2·25 to 4 in.; petioles ·3 to ·5 in.; stipules ·15 in long, broad, shortly cuspidate. *Cyme* terminal, corymbiform, trichotomous on a short peduncle, 2·5 to 4 in. long (including the peduncle) and rather more in diam., condensed, the branches many-flowered. *Calyx* sessile or on a short pedicel, less than ·1 in. long, with 4 triangular acute teeth shorter than the tube. *Corolla-tube* 1·25 to 1·5 in. long, narrowly cylindrical; its limb ·5 or ·6 in. across, its 4 lobes spreading or reflexed, ovate-lanceolate, blunt or sub-acute, ·25 to ·3 in. long; *stigma* slender, slightly exserted. *Fruit* compressed, fusiform, with 2 vertical grooves, glabrous. DC. Prod. IV, 486; Wall. Cat. 6138. Hook. fl. Fl. Br. Ind. III, 146. *I. Griffithi*, Hook. Bot. Mag. t. 4325. *I. fulgens*, Wall. Cat. 6512 B. *Pavetta congesta*, Miq. Fl. Ind. Bat. II, 269.

SINGAPORE: *Lobb*; *Anderson* 92; *Ridley* 5674, 6911. JOHORE: *King*, *Ridley* 4168. MALACCA: *Griffith* (K.D.) 2984; *Maingay* (K.D.) 848; 848-2; *Ridley* 5675, 6911; *Derry* 8; *Goodenough* 1967. PENANG: *Wallich*; *King*; *Curtis* 1729, 1730, 2265, 2975. PERAK: *Scortechini*; *King's Collector* 675, 2448 2865, 2867, 3982, 3998; *Wray*. DISTRIB.—Malayan Archipelago, Burma.

Allied to *I. Lobbii*, Lond. but with more coriaceous broader leaves, with more nerves, shorter flowers in more condensed cymes. The corolla is orange or red.

8. *IXORA UNDULATA*, Roxb. Hort. Beng. 10: Fl. Ind. I, 385. A glabrous shrub or small tree, the cymes often pubescent; young branches thinner than a goose-quill, pale-brown, shining. *Leaves* coriaceous, oblong-elliptic, sub-acute, the base much narrowed; both surfaces olivaceous-brown when dry, rather dull main-nerves about 12 pairs, thin



but distinct on both surfaces, curved, spreading; length 3·5 to 5 in.; breadth 1·25 to 2 in.; petioles ·3 to 4 in., stipules triangular, acuminate, ·2 in. long. *Cymes* nearly as long as the leaves, almost sessile, branching from near the base, the branches divergent, trichotomous, many-flowered, the bracteoles few and minute, lanceolate. *Calyx* sessile, less than ·1 in. long, cylindric, with 4 ovate-acute teeth. *Corolla-tube* ·25 to ·3 in. long, narrowly cylindric; the limb ·2 in. across, its 4 lobes narrowly oblong, blunt, reflexed. *Fruit* (in Indian specimens) fusiform, smooth. Roth Nov. Spec. 91; DC. Prod. IV, 488; Wight & Arn. Prod. 428; Wight Icon. 708; Hook. fil. Fl. Br. Ind. III, 147; Wall. Cat. 6129, excl. *Herb. Ham. I. canja*, Wall. Cat. 6130.

PERAK: at elevation of 4000 feet; *Wray* 3934.

Only once collected in our region. A common species at the base of the eastern Himalaya, and in the Khasia Hills.

9. *IXORA PENDULA*, Jack in Mal. Misc, I, 11. A small shrub, all parts glabrous except the branches of the inflorescence; young branches thinner than a goose-quill. *Leaves* thinly coriaceous, oblong to elliptic-oblong, sometimes slightly oblanceolate, sub-acute, the base more or less cuneate, both surfaces pale-olivaceous when dry, smooth, the upper shining, the reticulations fine, not prominent; main-nerve 12 to 16 pairs, curved, ascending, faint on the upper surface, thin but prominent on the lower; length 9 to 11 in.; breadth 2·5 to 3·5 in.; petiole ·5 to ·75 in., stout, channelled: stipules about ·2 in. long, broadly ovate, abruptly acuminate. *Cymes* terminal, 3-branched, pendulous, often nearly as long as the leaves (half the length being slender peduncle): branches puberulous trichotomous, with subulate bracts at the divisions; ultimate branchlets with about 9 flowers. *Calyx* under ·1 in. in length, with 4 short blunt teeth. *Corolla-tube* slender, cylindric, about 1·25 in. long, the limb about ·4 in. across, the 4 lobes oblong, blunt, reflexed. *Anthers* short, narrow, acute, sagittate at the base, longer than their filaments. *Stigma* slightly exserted. *Fruit* ellipsoid, blunt, smooth, ·3 in. long and ·25 in. in diam. Hook. fil. Fl. Br. Ind. III, 141.

In all the provinces, common.

The flowers of this are rose-coloured. The long slender drooping peduncle of the cyme has often a whorl of lanceolate bracteoles near the base, and the upper leaves of the stem are often much reduced in size. There are specimens in which the peduncle of the cyme is only 2 or 3 inches long, but usually it is twice as long.

10. *IXORA OPACA*, Br. in Wall. Cat. 6141. A small shrub, glabrous except the puberulous branches of the cyme; young branches thinner than a goose-quill, pale-brown. *Leaves* thickly membranous, oblong to elliptic-oblong, obtusely and shortly acuminate, the base rounded or

cuneate; both surfaces olivaceous when dry; the upper dark and shining; the lower paler, much reticulate, and dull; main-nerves 15 to 20 pairs, spreading, curved, prominent on the lower surface; length 4 to 7 in.; breadth 1.25 to 2.5 in.; petioles .3 to .5 in.; stipules triangular with broad bases and long linear points. *Cyme* corymbose, with many short spreading branchlets, sometimes laxly trichotomous, 2.5 to 5 in. across, terminal, on a slender erect peduncle 1 or 2 in. long. *Flowers* as in *I. pendula*, but smaller, the limb of the corolla being only .3 in. across. *Fruit* as in *I. pendula*, Jack. G. Don, Gen. Syst. Gard. III. 573. Hook. fil. Fl. Br. Ind. III. 147. *Pavetta opaca*, Miq. Fl. Ind. Bat. II. 270.

MALACCA: *Ridley* 966. PENANG: *Curtis* 3385. PERAK: *Wray* 3447: *King's Collector* 2699, 2805, 2829, 2917, 4061; *Ridley* 3071.—DISTRIB. Burma, Sumatra.

A species closely allied to *I. pendula*, Jack, but the cymes have shorter peduncles and the leaves are narrower.

11. IXORA LOBBII, Loudon, Encycl. Suppl. II, 1543. A shrub, everywhere glabrous except the smaller branches of the inflorescence and the calyces; youngest branches as thick as a duck's quill, dark-coloured, shining. *Leaves* thinly membranous, oblong, oblong-lanceolate or elliptic-oblong, rarely oblanceolate, the apex acute or shortly acuminate, the base cuneate; both surfaces rather pale-brown when dry and shining; main-nerves 15 to 25 pairs, rather straight, spreading, inter-arching at the tips, slender but distinct on the lower surface, very faint on the upper; length 5 to 8 in.; breadth 1.25 to 2 in.; petioles .2 to .3 in.; stipules triangular, acuminate, about .15 in. long. *Cymes* terminal, corymbose, shortly pedunculate, 3 to 8 in. across, the bracts and bracteoles minute, lanceolate, deciduous. *Calyx* cylindrical-campanulate, less than .1 in. long, its 4 broad blunt lobes shorter than the tube. *Corolla-tube* slender, cylindrical; 1 to 1.75 in. long; the limb .4 to .5 in. across; its 4 lobes narrowly oblong, blunt or sub-acute, spreading; stigma slender, slightly exerted. *Fruit* ellipsoid, blunt, .25 to .3 in. long and .25 to .3 in. in diam. (when dry), smooth. *I. fulgens*, Hook. fil. Fl. Br. Ind. (not of Roxb.) *in part.* *Pavetta Lobbii*, Teysm. & Binn. in Miq. Ann. Mus. Lugd. Bat. IV. 194.

MALAYAN ARCHIPELAGO; *Helper* (K.D.) 2998. MALACCA: *Griffith* (K.D.) 2985; *Maingay* (K.D.) 845; *Derry* 10, 966; *Cuming* 2396. PENANG: *Curtis* 479; *Lobb*. WELLESLEY: *Ridley* 6991. PERAK: *Wray* 476, 952, 2891, 3449; *King's Collector* 407, 2374, 2908, 3828, 4196, 5626, 5968; *Scortechini* 96, 349. SINGAPORE: *Lobb*; *King*; *Ridley*; *Anderson* 94. KEDAH: *Curtis* 2659.—DISTRIB. Malay Archipelago.

VAR. *angustifolia*, King & Gamble; leaves narrowly oblong-lanceolate about 1 in. in width.

SINGAPORE: King. PERAK: Wray 519; Scortechini 1893; King's Collector 2718. PAHANG: Ridley 2215.

This variety comes near to *Pavetta salicifolia*, Blume, but its leaves have more numerous main-nerves, and its corolla lobes are much shorter.

12. *IXORA FULGENS*, Roxb. Hort. Beng. 10: Fl. Ind. I. 378. A shrub, all parts glabrous: young branches thicker than a crow-quill, dark, shining. Leaves coriaceous, oblong-lanceolate or oblanceolate, shortly acuminate, the base cuneate; both surfaces shining when dry, the upper dark-brown, the lower paler; main-nerves 10 to 12 pairs, curved, spreading, interarching, slender; length 3.5 to 5.5 in., breadth 1.25 to 1.5; petiole .2 to .3 in.; stipules .2 in. long, triangular, the base broad, with a long linear point. *Cymes* terminal, corymbose, rather lax, spreading, .3 to .5 in. in diam., many-flowered; bracteoles triangular, minute. *Calyx* less than .1 in. long, cylindric-campanulate, with 4 shallow broad teeth. *Corolla-tube* 1.25 to 1.5 in. long, narrowly cylindric; its limb .8 in. across; the 4 lobes broadly ovate or lanceolate, acute, spreading. *Anthers* narrow, on short filaments. *Fruit* fusiform, somewhat 2-lobed, smooth, purple when ripe. DC. Prod. IV, 486: Wight Icon. 451: Wall. Cat. 6152; Hook. fil. Fl. Br. Ind. III. 146, *not of Roxb.*

SINGAPORE: Lobb 102. PERAK: Scortechini; Wray 3024; King's Collector 2949, 5075, 5522.

This species is not common. It has been confused with the much more common *I. Lobbii*, Loud. from which it differs in having about half as many leaf-nerves. It is to *I. Lobbii* that the description of *I. fulgens* given in the Flora of British India really refers.

13. *IXORA HUMILIS*, King & Gamble, n. sp. A small unbranched glabrous shrub little more than a foot high. Leaves large, coriaceous, sessile, elliptic to sub-panduriform, the apex sub-acute, narrowed below the middle to the broadly cordate auriculate base; both surfaces brown when dry, the lower paler and with the reticulations distinct; main-nerves 15 to 18 pairs, curved, slender but distinct, spreading and only slightly curved length 9 to 12 in.; breadth 3.5 to 4 in.; stipules of opposite sides united into a short tube with a cusp on each side. *Cyme* terminal, 2.5 to 3 in. long (including the short peduncle), and as much across; branches few and short, bracteoles minute. *Calyx* under .1 in. long, its lobes shorter than the tube, blunt. *Corolla-tube* about 1.5 in. long, narrowly cylindric; the limb about .7 in. across; its 4 lobes sub-rotund, spreading. *Anthers* linear, apiculate, on short filaments inserted in the throat. *Fruit* unknown.



PENANG: *Curtis* 400. SELANGOR: *Ridley* 7422a. PERAK: *Wray* 4157; *Ridley* 7186; *Yapp* 204; *Scortechini*.

A distinct species distinguished by its short bushy habit, and its large leaves tapered to a broad cordate-auriculate base.

14. *IXORA SCORTECHINI*, King & Gamble, n. sp. An unbranched shrub about a foot in height: the stem as thick as a goose-quill, pale-brown, rather rough. *Leaves* large, almost sessile, coriaceous, broadly oblanceolate, sub-acute or blunt, narrowed from about the middle to the rounded or cordate base; upper surface brown when dry and somewhat shining; the lower pale, reticulate and dull; main-nerves 8 to 12 pairs, slightly prominent on both surfaces, curving upwards, interarching length 5·5 to 9 in.; breadth 2 to 3 in.; petioles about ·1 in. long or absent; stipules very short, broadly triangular and with an abrupt linear point. *Cymes* terminal, about 2 in. long (including the short peduncle), the branches short, puberulous. *Calyx* nearly ·1 in. long, cylindric, with 4 very broad short blunt teeth. *Corolla-tube* 1 to 1·25 in. long, narrowly cylindric, glabrous; the limb ·5 in. across with 4 blunt broad oblong spreading lobes. *Fruit* fusiform, deeply 2-grooved, smooth.

PENANG: *Curtis* 400. PROVINCE WELLESLEY: *Ridley* 6992. PERAK: *Scortichini* 1277; *Wray* 4157; *King's Collector* 3120.

15. *IXORA STRICTA*, Roxb. Hort. Beng. 10: Fl. Ind. 1, 379. A large shrub, everywhere glabrous: young branches thicker than a crow-quill, dark-brown, shining. *Leaves* thin, coriaceous, lanceolate or elliptic. lanceolate, rarely elliptic, acute or acuminate, the base cuneate; upper surface olivaceous when dry, the lower brown; main-nerves 7 or 8 pairs: obsolete on the upper surface, faint and interarching on the lower; length 2·5 to 5 in.; breadth 1·25 to 2 in.; petiole ·15 to ·2 in.; stipules ·2 in. long, triangular, with broad bases and long linear points. *Cymes* almost sessile, terminal, corymbose, dense, 2 or 3 in. in diam., bracteoles minute. *Calyx* under ·1 in. long, cylindric, broadly 4-lobed or sub-entire. *Corolla-tube* narrow, cylindric, ·8 in. long; the limb ·4 in. across, its 4 lobes oblong, sub-acute or obtuse, spreading or reflexed. *Fruit* broadly fusiform, smooth. DC. Prod. IV. 486; W. & A. Prod. 427; Wight Ic. 184; Kurz For. Fl. Burma, II. 26; Wall. Cat. 6123; Hook. fil. fl. Br. Ind. III. 145. *I. coccinea*, Bot. Mag. 169. *I. alba*, Roxb. ll. cc.; Wight Ic. 707. Wall. Cat. 6122. *I. blanda*, Ker in Bot. Reg. t. 100; DC. l. c., 487. *I. incarnata*, Roxb. Fl. Ind. I. 379; DC. l. c. 486. *I. crocata*, Lindl. in Bot. Reg. t. 782; DC. l. c. 486. *I. rosea*, Wall. Cat. 6124; Bot. Mag. t. 2428, (not of Wall. in Roxb. Fl. Ind. I. 398). *I. amoena*, Wall. Cat. 6121 D.E.F.G.; Don, Gen. Syst. III. 571; Hook. fil. Fl. Br. Ind. III. 146. *I. densa*, Wall. Cat. 6150, *in part*.



MALACCA: *Griffith* (K.D.) 2986; *Maingay* (K.D.) 846, 846½, 849; *Goodenough* 1753; *Derry* 257. PERAK: *Wray* 3293, 3448; *King's Collector* 2247, 3978; *Scortechini*. PAHANG: *Ridley* 2227. SINGAPORE: *Ridley* 5004; *Lobb*. PENANG: *Wallich*; *Curtis* 1122; *Deschamps*. KEDAH: *Ridley* 7092. DINDINGS: *Ridley* 7187.—DISTRIB. British India, Burmah.

Owing to the beauty of its flowers this species is much cultivated in gardens. But it also occurs in a wild state. The corolla is usually scarlet, but individuals with white, rosy, or yellowish corollas are frequent. As regards leaves the species varies somewhat. I can find nothing except the slightly different reticulation of the leaves to distinguish *I. amoena*, Wall., and I have therefore reduced it here. In the *Flora of British India*, Sir Joseph Hooker, without actually making the reduction, expresses himself in favour of it.

16. *IXORA CONGINNA*, Br. in Wall. Cat. 6149. A shrub, all parts glabrous: young branches slightly thicker than a crow-quill, pale-brown. *Leaves* thinly coriaceous, elliptic-oblong or elliptic-oblongate, very shortly and rather bluntly acuminate, the base cuneate: both surfaces slightly shining when dry, olivaceous-brown, the lower the paler; main-nerves 8 or 9 pairs, slender, slightly depressed on the upper and prominent on the lower surface; length 2·5 to 5 in.; breadth 1 to 1·75 in.; petioles ·15 to ·25 in.; stipules triangular, ·2 in. long with broad bases and long stiff linear apices; a few of the upper leaves much reduced in size. *Cymes* (including their peduncles) from 1 to 1·5 in. long, three or four collected at the apex of a branch, each 5- or 6-flowered; bracteoles minute. *Calyx* under ·1 in. long, campanulate, with 4 broad teeth shorter than the tube. *Corolla-tube* about ·4 in. long, narrowly cylindrical; the limb about ·3 in. across, its 4 lobes oblong, spreading, blunt. *Fruit* about as large as a small pea, broader than long, deeply 2-grooved, glabrous. Hook. fil. Fl. Br. Ind. III. 647. *Rubiacea*, Wall. Cat. 8449.

SINGAPORE: *Wallich*; *Ridley* 8451. MALACCA: *Griffith*; *Lobb* 189; *Maingay* (K.D.) 847; *Derry* 962. PERAK: *Scortechini* 174; *Wray* 1317; *King's Collector* 3068, 3978, 3530, 4639, 5648.

17. *IXORA GRANDIFOLIA*, Zoll. & Mor. Syst. Verz. 65. A bush or small tree, quite glabrous or with the cymes puberulous; young branches pale-brown when dry, not so thick as a goose-quill (paler and thinner in some vars.). *Leaves* large in the typical form, sub-coriaceous, elliptic, ovate (oblong or lanceolate in vars.), obtuse or acute, the base cuneate or broadly rounded, sometimes (in vars.) minutely cordate, both surfaces brown when dry, shining, obscurely reticulate; main-nerves 8 to 12 pairs, not usually very prominent on either surface: length 8 to 10 in. (less in var. 3), breadth 3 to 5 in. (less in var. 3), petiole ·5 to ·75 in. stout (shorter in some vars.); stipules broad, ·35 in. long, cuspidate

or sometimes bifid. *Cymes* varying, always pedunculate, laxly trichotomous, or in var. 2 densely crowded, 3 or 4 in. across (much less in var. 2) the branches cinereous-puberulous. *Flowers* crowded, shortly pedicellate, glabrous, about .5 in. long, (longer in vars.). *Calyx* under .1 in. long, with 4 blunt teeth shorter than the tube. *Corolla-tube* cylindric, slender, .35 in. long. (longer in vars. 2 and 4), the limb with 4 broad blunt oblong reflexed lobes .15 in. long: stigma narrowly clavate in bud. *Fruit* broadly fusiform, smooth. Hook. fil. Fl. Br. Ind. III. 143. *I. elliptica*, Br. in Wall. Cat. 6153.

MALACCA: *Griffith*; *Maingay* (K.D.) 843. PENANG: *Wallich* 6153. PERAK: *King's Collector* 410, 4083, 4756; *Scortechini* 1368.—DISTRIB. Nicobars, *Kurz*.

A very variable species of which the following forms may be distinguished. The corolla is white.

VAR. 1 *gigantea*, King & Gamble. A tall tree, leaves very coriaceous, elliptic, obtuse at base and apex, 7 to 10 in. long and 3 to 5 in. broad; cymes (including their peduncles) 3 to 7 in. long, with spreading puberulous branches; corolla about .5 in. long.

PENANG: *Curtis*, 3384. SINGAPORE: *Ridley*, 4120. PERAK: *Wray* 2973, 3678, 3971; *King's Collector* 5609, 5466, 10294. ANDAMANS: *Heinig* 22.

This may be separable as a species. More specimens (in flower) are wanted.

VAR. 2 *coriacea*, Hook. fil. Fl. Br. Ind. III. 143 (excl. syn. *I. macrosiphon*); leaves very coriaceous, oblong-lanceolate or oblong-elliptic, sub-acute, the base cuneate; length 8 to 10 in.; breadth 2.5 to 3 in.; cymes (including their peduncles) 3 in. long or less. *Corolla* about .6 in. long. *I. coriacea*, Br. in Wall. Cat. 6151.

PENANG AND SINGAPORE: *Wallich*; *Curtis* 2486. MALACCA: *Griffith* in Herb. Wight, (K.D.) 2999; *Maingay* (K.D.) 844. PERAK: *Wray* 2140, 2626; *King's Collector* 5935. PAHANG: *Ridley* 2213.—DISTRIB. Andaman Islands.

There is in Herb. Calcutta a single specimen (in flower only) collected by *Ridley* in Pahang (Herb. *Ridley* 2213) which in most of its characters resembles this. The texture of the leaves and their nervation are however slightly different, and the flowers are somewhat longer and in less spreading cymes.

VAR 3 *arborescens*, Hook. fil. l.c.; branches thinner than a goose-quill, the bark very pale; leaves sub-coriaceous, only 4 to 6 in. long, and from 2 to 2.5 in. broad; sub-obtuse at the apex and broadly rounded at the base, the petiole only .3 to .4 in. long; cymes (including peduncle) 3 to 7 in. long, the branches long and spreading: corolla little more than .5 in. long. *I. arborescens*, Hassk. in *Retzia* I. 22.

MALACCA: *Griffith* Herb. Wight, (K.D.) 2987; *Derry*, 310, 571;

*Cumming* 2332. PERAK: *King's Collector* 4686. JOHORE: *Ridley* 4165.  
—DISTRIB. Andaman Inlands.

VAR. 4 *Kurzeana*, Hook. fl. l.c.; leaves sub-coriaceous, elliptic to elliptic-oblong, the apex acute; the base rounded or cuneate; corolla 1.25 in. long. *I. Kurzeana*, Teysm. & Binn. in Nat. Tijds. Ned. Ind. 100. *I. macrosiphon*, Kurz in Trimen Journ. Bot. 1875, 327; For. Flora Burm. II. 24.

ANDAMAN ISLANDS: *Kurz, Prain's Collector.* SUMATRA, JAVA, &c.

18. IXORA DIVERSIFOLIA, Wall. Cat. 6146. A shrub or small tree, the branches of the inflorescence slightly puberulous, otherwise glabrous; young branches thinner than a goose-quill, pale when dry. Leaves membranous, oblong to broadly elliptic, acute or sub-acute, the base rounded or cuneate; the upper pair sometimes sessile and sub-cordate, often reduced in size, the majority with stout petioles .3 or .4 in. long; both surfaces smooth, shining, brown when dry; main-nerves 10 to 12 pairs, curved, spreading, prominent as the lower surface; length of blade 4 to 10 in.; breadth 2 to 4 in.; stipules elongated-triangular, .25 in. long (sometimes longer and sometimes blunt). Cyme 3 to 4 in. in diam. (its slender peduncle included) 3 to 6 in. long, trichotomous; the ultimate branchlets minutely bracteolate at the divisions, 2- to 3-flowered. Flowers .4 to .6 in. long, mostly on short puberulous pedicels, some sessile, glabrous. Calyx less than .05 in. long, the 4 teeth shorter than the tube, blunt. Corolla-tube narrowly cylindrical, very short in the bud, afterwards lengthening to .2 to .4 in.; sometimes longer, lobes of the limb 4, narrowly oblong, sub-acute, much reflexed, .2 in. long. Stigma exserted, clavate at first, the arms afterwards divergent. Fruit ellipsoid, blunt, .3 in. long and .2 in. diam. (when dry) glabrous. Kurz. For.; Flora Burm. II. 22; Hook. fl. Fl. Br. Ind. III. 141.

PENANG: *Curtis*, 2486. PERAK: *King's Collector* 5691, 5737, 5896; (*Wray* 3491?); *Scortechini* 168.—DISTRIB. Burma; *Griffith* (K.D.) 2992.

The corolla of this is much shorter than those of *I. pendula*, and it is white and the leaves are often broader. The two species are closely allied. A form collected in Perak by *Wray* (No. 3491) connects the two, combining the longer corollas and peduncles which are characteristic of *I. pendula* with the general facies of *I. diversifolia*.

#### 40. PAVETTA, Linn.

Characters of *Ixora*, but the style very slender and much longer than (often twice as long as) the corolla-tube; the stigma not thicker and sometimes even thinner than the style and usually entire; the stipules larger and sheathing, especially those of the lower part of the



inflorescence; leaves membranous.—Species about 70, in the tropics of the old world.

Large much branched shrubs; cymes corymbose pedunculate, 2 to 4 in. in diam., often in panicles:—

Leaves pubescent to tomentose beneath, ovate-elliptic, elliptic or elliptic-rotund ... .. 1 *P. indica*.

Leaves slightly pubescent to glabrous beneath, elliptic lanceolate or oblanceolate ... .. 1 *P. indica* var. *glabra*.

Small little branched or unbranched shrubs; cymes sessile or nearly so, 1 to 2 in. in diam., never in panicles: leaves pubescent beneath:—

Calyx woolly; leaves densely and softly pubescent beneath 2 *P. naucleiflora*.

Calyx glabrous or nearly so; leaves hispidulous beneath... 3 *P. humilis*.

1. *PAVETTA INDICA*, Linn. sp. Pl. 110. A shrub or small tree, young branches slender, glabrous, pubescent, or tomentose like the leaves. *Leaves* membranous, variable in form, in the Malayan specimens (VAR. *polyantha*) elliptic-lanceolate or oblanceolate, in the British Indian ovate-elliptic, elliptic, or elliptic-rotund; in all, except some of the latter, acute or acuminate at the apex, pubescent tomentose or glabrous beneath, the base always much narrowed; main-nerves 5 to 7 pairs, usually faint, curved; length (in Malayan specimens) 4 to 7 in.; breadth 1 to 2 in.; petiole .35 to 5 in.; stipules triangular, acuminate, shorter than the petioles, deciduous. *Cymes* terminal, shorter than the leaves, on peduncles 1.5 to 4 in. in length, corymbose, many-flowered, 2 to 4 in. in diam., often in panicles; the stipules at the bifurcations rather large and persistent. *Flowers* on pedicels about .2 in. long. *Calyx* from .05 to .1 in. long, narrowly campanulate, with 4 short triangular teeth or sub-truncate. *Corolla* .5 to .75 in. long; the tube very slender, cylindrical; the limb .3 to .4 in. across, with 4 oblong blunt lobes. *Style* much exerted, slender like the stigma. *Fruit* globular-oblong, glabrous, about the size of a pea. Wall. Cat. 6175; Blume Bijdr. 951; W. & A. Prod. 431; Wight Ic. t. 148; Miq. Fl. Ind. Bat. II. 276; Hook. fil. Fl. Br. Ind. III. 150; Trim. Fl. Ceyl. II. 349. *P. Finlaysonianana*, Wall. Cat. 6177. *P. alba*, Vahl. Symb. III. 11. *P. petiolaris*, Wall. Cat. 6786; Hook. fil. Fl. Br. Ind. III. 150. *Ixora paniculata*, Lam. Dict. III. 344. *I. Pavetta*, Roxb. Fl. Ind. I. 385; Kurz Fl. Burm. II. 18.

In all the provinces, but not common.

VAR. *polyantha*, Hook. fil. l.c. 150. *Flowers* numerous, crowded in puberulous or pubescent cymes; leaves thinly membranous, oblanceolate or elliptic-lanceolate, glabrous or puberulous beneath. *P. polyantha*, Wall. Cat. 6176; Bot. Regist. t. 198. *P. graciliflora* Wall. Cat. 6178. *P. petiolaris*, Wall. Cat. 6180. *P. Rothiana*, DC. Prod. IV. 491:



W. & A. Prod. 431. *P. villosa*, Heyne in Roth. Nov. Sp. 88 (not of Napl.)  
*Ixora tomentosa* VAR. *glabrescens*, Kurz. Fl. Burm. II. 19.

In all the provinces: common.

The variety *tomentosa*, Hook. fil. l.c. characterised by ovate or rotund elliptic often subacute thickly membranous leaves more or less pubescent or tomentose, and with the inflorescence also pubescent or tomentose occurs chiefly in British India. The synonymy of it is as follows: *P. tomentosa*, Wall. Cat. 6173 all the sheets except E.: *P. velutina* 6174: *P. mollis* 6179; *P. canescens* 6181.

2. PAVETTA NAUCLEIFLORA, Wall. Cat. 6171. A shrub or small tree, young branches thicker than a crow-quill, tawny-tomentose. *Leaves* oblanceolate, shortly acuminate, narrowed from above the middle to the petiole; both surfaces olivaceous when dry; the upper at first pubescent, afterwards becoming less so, but even when adult the midrib always pubescent; the lower densely and persistently pale-pubescent, especially on the midrib and 9 or 10 pairs of oblique prominent main-nerves; length 4·5 to 7 in.; breadth 1·35 to 2·75 in.; petiole ·3 to ·75 in., pubescent. *Stipules* broadly triangular, acuminate. *Cymes* terminal, solitary, densely compound-umbellate, 1·75 in. broad and not quite so long, the branches and pedicels densely pubescent; branches divaricate with a few ovate-lanceolate bracteoles near the flowers. *Flowers* ·75 in. long, excluding the style, on unequal pedicels always longer than the calyx. *Calyx* tubular ·1 in. long, ribbed, densely pubescent, the mouth with 5 short triangular erect teeth. *Corolla-tube* narrowly cylindrical, sub-glabrous; limb pubescent and with 4 oblong blunt lobes. *Fruit* globular not ridged, sparsely hairy, crowned by the small calyx, ·25 in. in diam. two-celled by abortion. *Seed* single fleshy, convex on the back; G. Don, Gen. Syst. III. 575: Hook. fil. Fl. Br. Ind. III. 152. *Ixora naucleiflora*, Kurz, For. Flora. II. 19.

PENANG: Curtis 1060, 2217, 2646, 3382. PERAK: *Scortechini*; Wray 3619.—DISTRIB. Base of Eastern Himalaya, Burma.

3. PAVETTA HUMILIS, Hook. fil. Fl. Br. Ind. III. 151. A small shrub with unbranched pale rough stem 6 to 12 in. long, densely pubescent at first but afterwards sub-glabrous. *Leaves* membranous, close together, oblong-oblanceolate, shortly acuminate, much narrowed at the base; upper surface minutely rugulose when dry, glabrous, the midrib sparsely adpressed-hispid; lower surface sub-adpressed hispidulous: main-nerves 6 or 7 pairs, faint, little curved, ascending; length 3·5 to 6 in.; breadth 1·25 to 1·75 in.; petiole ·3 to ·5 in., swollen at the base, hispid; *stipules* broadly triangular, acuminate, hispid. *Cymes* solitary, terminal, sessile or sub-sessile, usually 1 to 1·5 in. in diam., dense. *Flowers* shortly pedicellate, glabrous, ·75 in. long. *Calyx* funnel-shaped, the mouth with 4 short acute teeth. *Corolla-tube* about ·6 in. long,

narrowly cylindric, the limb with 4 blunt oblong lobes. *Fruit* globular, glabrous, .25 in. in diam.

MALACCA: *Griffith* (K.D.) 3007; *Maingay* (K.D.) 855; *Hullett*, 763.

#### 41. MORINDA, Linn.

Shrubby, sometimes scandent; rarely arboreous. *Leaves* membranous, rarely in whorls of three: stipules connate, sheathing. *Flowers* connate by their calyces, axillary or terminal, simple paniced or umbellate pedunculate heads. *Calyx-tube* short, the limb short or absent. *Corolla* salver- or funnel-shaped, coriaceous, the tube short; the limb usually 5- (rarely 4- to 7-) lobed, valvate in bud. *Stamens* equal in number to the corolla-lobes, on short filaments; anthers linear or oblong, dorsi-fixed. *Ovary* 2- or spuriously 4-celled; style included or exerted, 2-branched: ovules solitary in the ovarian cells, ascending. *Fruit* formed of the succulent enlarged calyces; the contained pyrenes 1-seeded, horny or cartilaginous, usually free but 2 or 4 of them sometimes cohering together. *Seeds* obovoid or reniform, with membranous testa and fleshy or horny albumen; the embryo terete, radicle inferior.—DISTRIB. Species about 40, all tropical.

Erect shrubs or trees, with pulpy infrutescences	...	1. <i>M. citrifolia</i> .
Large woody climbers:—		
Infrutescence dry, more than 1 to 2 in. in diam., externally marked with many large deeply pitted hardened calyces	... ..	2. <i>M. lacunosa</i> .
Infrutescence about 1 in. in diam., pulpy, smooth, bearing externally a few long narrow soft tubular calyces	... ..	3. <i>M. rigida</i> .
Infrutescence about .25 in. in diam., without large protruding calyces	... ..	4. <i>M. umbellata</i> .

1. MORINDA CITRIFOLIA, Linn. Sp. Pl. 176. A glabrous small tree or large shrub; young branches thinner than a goose-quill, obtusely 4-angled, pale-brown. *Leaves* broadly elliptic, occasionally obovate-elliptic, shortly acuminate, the base cuneate, one of the pair opposite the peduncle often suppressed; both surfaces pale-brown when dry: main-nerves 6 or 7 pairs, curved upwards, thin but slightly prominent on both surfaces; length 5 to 10 in.; breadth 2.25 to 4.5 in.; petioles .2 to .4 in.; stipules transversely oblong or sub-orbicular, entire or 2- to 3-fid., .3 to .5 in. long. *Peduncles* axillary, solitary, about .5 in. long, each bearing a many-flowered capitulum 1 to 1.75 in. in diam. *Calyx* truncate. *Corolla* fusiform in bud: the tube .3 to .5 in. long, pubescent in the throat, otherwise glabrous: limb .5 or .6 in. across, with 5 lanceolate lobes. *Anthers* with their tips exerted, filaments woolly. *Infrutescence* when

ripe ovoid or globose, 1 to 1.75 in. long, yellow, fleshy: each pyrene 2-seeded. Roxb. Fl. Ind. I. 541; Hunter in As. Resear. IV. 35; DC. Prod. IV. 446; Ham. in Trans. Linn. Soc. XIII. 533; W. & A. Prod. 419; Wall. Cat. 8418; Brand. For. Flora, 277; Kurz, For. Fl. Burm. II. 60; Hook. fil. Fl. Br. Ind. III. 155; Trimen Fl. Ceyl. III. 354; Gaertn. Fruct. I. 29. *M. bracteata*, Roxb. Hort. Beng. 15; Fl. Br. Ind. I. 544; Ham. l.c. 534; DC. l.c. 447; W. & A. l.c.; Wight Ill. t. 126; Wall. Cat. 8419; Brandis l.c. 277.

In all the provinces: in or near cultivation, but probably in many cases not wild.—DISTRIB. Brit. India, Ceylon, Malay Archipelago.

VAR. *elliptica*, Hook. fil. l.c. *Leaves* narrowly elliptic-oblong, tapering to each end, shining: peduncles slender, 1 to 1.5 in. long: fruiting heads .5 to .75 in. diam. Wall. Cat. 8434.

In all the provinces: more frequent than the typical form.

2. *MORINDA LACUNOSA*, King & Gamble, n. sp. A powerful climber 30 to 60 feet long: young branches thinner than a goose-quill, angled, sparsely and minutely pubescent. *Leaves* thickly membranous, elliptic, sharply and shortly acuminate, the base cuneate; upper surfaces dark-brown when dry, glabrous except the puberulous midrib; lower paler, the reticulations very distinct; main-nerve about 8 pairs, curving upwards, very bold on the lower surface, slightly depressed and faint on the upper; length 4.5 to 6 in.; breadth 2 to 2.75 in.; petioles .5 to 1.25 in.; stipules apiculate, only .15 in. long. *Heads* about .5 in. in diam. (when in flower) with one or two linear coriaceous bracts at their bases, solitary, on puberulous peduncles about 1 in. long, collected in twos or threes at the apices of the branches. *Calyces* completely confluent by their sides, irregularly cupular, the limb coriaceous, produced into a large oblique triangular lobe at one side, otherwise sub-truncate. *Disk* large, cushion-like, convex. *Corolla* unknown. *Infrutescence* (when ripe) globular, 1.5 in. in diam.; the surface covered with the protruding irregularly 4-sided conical enlarged calyces, each with a wide pit on its apex; individual fruits 2-celled, 2-seeded.

PERAK: *King's Collector*, 4320, 6030, 8254; *Scortechini*.

This is easily distinguished by its large deeply pitted infrutescence which is dry, not at all pulpy.

3. *MORINDA RIGIDA*, Miq. Fl. Ind. Bat. II. 246. A woody climber 20 to 30 feet long; young branches thinner than a goose-quill, at first minutely rusty-tomentose, afterwards with glabrescent pale spongy bark. *Leaves* dark-coloured when dry, the edges recurved, thickly coriaceous, narrowly elliptic, shortly and bluntly acuminate or blunt, the base cuneate; upper surface shining, glabrous except the pubescent



base of the midrib; the lower uniformly pale-pubescent; midrib distinct; main-nerves (18 to 12 pairs) very indistinct on both surfaces; length 2 to 4 in.; breadth 1 to 1.6 in.; petiole .3 or .4 in., pubescent. *Stipules* broadly oblong, blunt, scaly, .2 in. long. *Capitula* on puberulous peduncles .2 to .3 in. long, in fascicles of 3 or 4 at the apices of the branches. *Flowers* .4 in. long, confluent by their calyces into globular capitula .2 in. in diam. *Calyx* very short, cupular. *Corolla* salver-shaped, .35 in. long, the tube narrow, the limb with deflexed oblong blunt lobes .1 in. long, densely hairy on the upper surface. *Infrutescence* when ripe pulpy, elliptic (often transversely so) with one or two elongate very protruding enlarged calyx-tubes.

PERAK: *King's Collector* 4004; *Wray* 2284; *Ridley* 7204, 10258; *Hullett* 5665. SINGAPORE: *Ridley* 3818, 4126. MALACCA: *Griffith* (K. D.) 2947; *Maingay* (K. D.) 874.—DISTRIB. Borneo.

4. MORINDA UMBELLATA, Linn. Sp. Pl. 176. A powerful glabrous climber; young branches thinner than a goose-quill, pale-brown, angled, shining. *Leaves* thinly coriaceous, narrowly oblong or elliptic-lanceolate, the apex shortly acuminate, the base much narrowed; both surfaces pale olivaceous-brown when dry, transversely reticulate; main-nerves 5 or 6 pairs, curved, ascending, faint; length 3.5 to 5 in.; breadth 1 to 1.35; petioles .2 to .3 in.; stipules sheathing, entire, truncate, or slightly toothed, .15 in. long. *Heads* sub-globular, about .25 in. in diam., on slender peduncles varying from .35 to 1 in. in length (lengthening in fruit to nearly 2 in.) from 5 to 8 collected in an ebracteate umbel at the end of a branch. *Calyx* sessile, truncate. *Corolla* almost rotate, longer than the calyx, its tube about 1 in. long, slightly constricted at the mouth, throat densely villous; limb .2 in. across, its lobes oblong, obtuse, glabrous on the outer surface, densely woolly on the inner. Ripe infrutescences about .25 in. in diam. DC. Prod. IV. 449; W. & A. Prod. 420; Wall. Cat. 8431; Kurz For. Flora, Burma, II. 62; Hook fil. Fl. Br. Ind. III. 157. *M. scandens*, Roxb. Fl. Ind. I. 548; DC. Prod. IV. 449. *M. tetrandra*, Jack in Mal. Misc. I. 13; Wall. Cat. 8432; Roxb. Fl. Ind. ed. Carey & Wall. II. 203; DC. l.c. *M. Padavora*, Juss. Gen. 206. *Morinda*, Wall. Cat. 8429.

In all the provinces; common.—DISTRIB. Burma, Southern India and Ceylon, Malay Archipelago, China, Japan, Australia.

VAR. *Scortechinii*, King & Gamble. Young branches, under surfaces of the leaves, and peduncles rusty-pubescent; leaves elliptic-obovate, shortly and abruptly acuminate; pedicels 1.5 to 2 in. long.

PERAK: *Scortechinii* 2015. Collected only once.

VAR. *Ridleyi*, King & Gamble. Young branches and under surfaces

of the leaves softly pubescent; *leaves* oblanceolate or oblong-lanceolate, shortly acuminate: peduncles less than 1 in. long.

SINGAPORE: in Botanic Garden Jungle, *Ridley* 5668, 6470, 6471, 6916.

#### 42. RENNELLIA, Korthals.

Characters of *Morinda* but the heads few-flowered and in terminal panicles, the ovules peltate; the seeds thin, orbicular.—DISTRIB. 5 or 6 Malayan species.

NOTE.—In this we include the genus *Tribrachya*, Korthals, which, as described by its author, differs from *Rennellia* only in having the flowers in each head limited to three.

Inflorescence paniculate	...	...	...	1 <i>R. paniculata</i> .
„ spicate	...	...	...	2 <i>R. speciosa</i> .

1. RENNELLIA PANICULATA, King & Gamble, n. sp. A small glabrous tree or shrub; young branches at first dark-brown, afterwards becoming pale, striate, thickened at the nodes. *Leaves* sub-coriaceous, elliptic, acute or shortly acuminate, the base much narrowed; upper surface dark-brown when dry; the lower paler-brown, finely reticulate; main-nerves 10 to 12 pairs, slightly curved, spreading, prominent like the midrib on the lower surface, indistinct on the upper; length 6 to 9 in.; breadth 2.25 to 3.75 in.; petioles .8 to 1.25 in.; stipules oblong, obtuse, .4 in. long. *Inflorescence* paniculate, erect, terminal; the branches opposite, or sometimes whorled, .6 to .9 in. long, each bearing at its apex 3 or more sessile flowers. *Calyx* a very shallow entire cup. *Corolla* coriaceous; the tube cylindric, .5 in. long; the limb nearly as long as the tube with 5 recurved lobes. *Anthers* included, attached near the throat, versatile, on short filaments. *Style* short; stigmas lanceolate. *Infrutescence* globular, .5 in. in diam., glabrous, with several orbicular calyces protruding on the surface.

PERAK: *Scortechini* 316; *King's Collector* 2164, 2592, 5432. PENANG: *Curtis*.

2. RENNELLIA SPECIOSA, Hook. fil. Fl. Br. Ind. III. 158. A small glabrous shrub; young branches about as thick as a goose-quill, pale, striate, thickened at the nodes. *Leaves* thinly coriaceous, oblanceolate or elliptic-lanceolate, shortly acuminate, the base much narrowed; upper surface olivaceous-brown, the lower olivaceous, reticulate; main-nerves 7 to 9 pairs, curved, ascending, slightly prominent; length 5 to 9 in.; breadth 1.5 to 3.5 in.; petioles .5 to 1 in.; stipules coriaceous, often 2-lobed, oblong, sub-acute, breaking off about the middle. *Inflorescence* 1 to 2 in. long, terminal, erect, on a short petiole; flowers from 3 to 6 on very short branches. *Calyx* sessile, cupular, truncate. *Corolla* coriaceous, .75 in. long, salver-shaped; limb with 5 short oblong

blunt sub-erect lobes. *Infrutescence* the size of a large pea. *Morinda speciosa*, Wall. Cat. 8436; Kurz For. Fl. Burma, II. 62.

MALACCA: *Griffith* (K.D.) 3046; *Maingay* (K.D.) 918/2. PERAK: *Scortechini* 668; *Ridley* 7197; *Wray* 2897, 4008; *King's Collector* 495, 5967.—DISTRIB. Burma.

VAR. *elongata* King & Gamble: *inflorescence* 2 to 6 in. long; flowers mostly in threes.

WELLESLEY PROVINCE: *Ridley* 7010. PAHANG: *Ridley* 2193, 5834. PERAK: *King's Collector* 3926; *Ridley* 9710; *Scortechini* 106.—DISTRIB. Sumatra.

#### 43. PRISMATOMERIS, Thwaites.

Shrubs with compressed 4-angled branches. *Leaves* sub-coriaceous; stipules 1- or 2-cuspidate. *Flowers* unisexual, usually on slender pedicels, in sub-umbellate axillary and terminal, sometimes pedunculate fascicles. *Calyx-tube* in the male flowers small, turbinate; in the female longer, obovoid, persistent; limb cupular. *Corolla-tube* cylindric, with glabrous throat; lobes of the limb 4 or 5, spreading, valvate in bud. *Stamens* included in the corolla-tube and equal in number with the lobes of the limb; dorsifixed near their bases by short filaments. *Ovary* 2-celled; style filiform, with 2 linear or lanceolate arms; ovules solitary in each cell, attached above the middle of the septum. *Berry* small, 1-celled, 1-2-seeded. *Seed* sub-globose, peltate, deeply concave in the ventral surface; testa membranous; embryo small; cotyledons reniform; radicle inferior.—DISTRIB. 3 or 4 species, in tropical India, Ceylon and Malaya.

Flowers on rather long slender pedicels ...	...	1	<i>P. albidiflora</i> .
Flowers sub-sessile or sessile ...	...	2	<i>P. subsessilis</i> .

1. PRISMATOMERIS ALBIDIFLORA, Thw. in Hook. Kew Journ. VIII. 268, t. VII. f. A. An evergreen shrub or small tree, glabrous; young branches thicker than a crow-quill, pale. *Leaves* narrowly elliptic or elliptic-lanceolate, sometimes oblanceolate, the apex much acuminate, the base much narrowed; both surfaces pale-greenish or yellowish-brown, and rather dull when dry; the lower reticulate; main-nerves 5 to 7 pairs, curved, spreading and interarching about a line from the edge; length 2.5 to 4.5 in.; breadth .75 to 1.5 in.; petioles .1 to .2 in.; stipules small, fugacious. *Flowers* usually in sessile fascicles, rarely in pedunculate umbels; pedicels .3 to .75 in. long, ebracteolate, filiform. *Calyx* .05 to .1 in. long. *Corolla* white; the tube .5 to .75 in. long, narrowly funnel-shaped, the lobes of the limb narrowly oblong, blunt, nearly as long as the tube, spreading. *Fruit* globose or ovoid, smooth, .25 in. in diam. Thwaites Enum. Pl. Ceyl. 154, 421; Bedd. Ic. Pl. Ind. Or. t. 93; Hook. fil. Fl. Br. Ind. III. 159; Trimen Fl. Ceylon, II. 355.



*Coffea tetrandra*, Roxb. Fl. Ind. I. 538; Wall. Cat. 6242; DC. Prod. IV. 499; Kurz For. Fl. Burma. II. 28. *Rubia*, Wall. Cat. 8470.

In all the Provinces: common.—DISTRIB. Burma, Khasia Hills, Malay Archipelago, Ceylon.

Besides the foregoing there is in Herb. Calcutta a single specimen (Ridley 2196) with flowers only in bud and no fruit. This is distinguished by ovate-elliptic leaves with 4 or 5 pairs of slightly curved ascending nerves, and few-flowered lax panicles on filiform axillary peduncles about 1.5 in. long.

2. PRISMATOMERIS SUBSESSILIS, King & Gamble. A glabrous shrub: young branches thinner than a goose-quill, pale, polished. *Leaves* narrowly elliptic, the apex and base acuminate; both sides pale-brown when dry, dull, the midrib prominent, the reticulations obsolete; main-nerves 5 to 7 pairs, slender, spreading, interarching .1 in. from the edge; length 2.25 to 4.5 in.; breadth .75 to 1.35 in.; petiole .15 to .4 in.; stipules under .1 in. in length, broad, connate into a ring, each 2-toothed. *Flowers* 2 or 3, on very short pedicels, or sessile, in a terminal fascicle. *Calyx* about .2 in. long, funnel-shaped, the limb wide, about as long as the tube, truncate with minute acute teeth. *Corolla* 1.25 in. long, salver-shaped, the tube narrow; the limb nearly as long as the tube, divided to its base into 5 narrowly lanceolate, deflexed, coriaceous lobes. *Fruit* a broad smooth didymous berry, about .6 in. in diam. and .5 in. long.

PERAK: *Scortechini* 355; *Wray* 289; *King's Collector* 8071: at elevations of 3000 to 4500 feet.

Differs from *P. albidiflora* in its nearly sessile flowers and larger calyx, corolla and fruit.

#### 44. GYNCHTHODES, Blume.

Climbing glabrous shrubs with slender terete branches. *Leaves* opposite, coriaceous or sub-coriaceous; the stipules broad, acute, deciduous. *Flowers* small, on short pedicels, unisexual, in axillary fascicles or pedunculate heads; bracts deciduous. *Calyx* with a small short tube, the limb annular, truncate or 5-toothed, persistent. *Corolla* coriaceous with a short tube and woolly throat; the limb with 4 or 5 oblong-lanceolate lobes, valvate in bud, the apices inflexed. *Disk* broad, depressed. *Stamens* equal in number to the corolla lobes, on short filaments, dorsi-fixed, in the corolla tube, linear-oblong, exserted. *Ovary* 4-celled; style of male flower entire; of female stout, bifid. *Ovules* 1 in each cell, broad-based, attached to the inner angle of the cell. *Drupe* globose, fleshy, with 2 to 4 dorsally compressed pyrenes. *Seeds* compressed, ascending; testa membranous; embryo small, basal, radicle inferior.—DISTRIB. 3 or 4 species, all Malayan.

- Leaves broad and rounded at the apex, sometimes with a short broad blunt point, 2·25 to 4 in. long and 1·25 to 2·25 in. broad; fruit ·5 in. in diam. ... .. 1. *G. coriacea*.
- Leaves acuminate at the apex, elliptic-lanceolate (often narrowly so) 2·25 to 3·25 in. long and ·5 to 1·1 in. broad; fruit the size of a pea ... .. 2. *G. sublanceolata*.
- Leaves shortly and abruptly acuminate, rarely subacute, 3·5 to 5 in. long and 1·35 to 2·5 in. broad; fruit globose, ·5 to ·6 in. in diam. ... .. 3. *G. macrophylla*.

1. GYNOCHTHODES CORIACEA, Blume Bijdr. 993. Young branches thinner than a goose-quill, nearly black. *Leaves* thinly coriaceous, elliptic, elliptic-rotund or elliptic-obovate, obtuse or shortly bluntly and abruptly apiculate, much narrowed to the base; main-nerves 4 to 6 pairs, spreading, only slightly curved, faint; both surfaces alike, nearly black, slightly shining; length 2·25 to 4 in.; breadth 1·2 to 2·25 in.; petioles ·4 or ·5 in.; *Flowers* ·3 in. long, few, on short axillary peduncles. *Corolla-tube* very narrow, about as long as the limb; lobes of limb linear-oblong, densely hirsute on the upper surface, spreading. *Fruit* globose, pulpy, 4-celled; pyrenes 1-seeded. Miq. Fl. Ind. Bat. II. 313; DC. Prod. IV. 467.

SINGAPORE: (Bot. Garden Jungle), Ridley 6410, 10393, 2871.—  
DISTRIB. Java, Borneo, Timor.

2. GYNOCHTHODES SUBLANCEOLATA, Miq. Fl. Ind. Bat. Suppl. 548. Branches thinner than a goose-quill, dark-coloured when dry. *Leaves* thinly coriaceous, elliptic lanceolate, often narrowly so, acuminate, the base much narrowed; both surfaces dull and blackish when dry; main-nerves indistinct, 5 or 6 pairs, ascending, little curved; length 2·25 to 3·25 in.; breadth ·5 to 1·1 in.; petioles ·2 to ·4 in.; stipules triangular. *Flowers* few, about ·35 in. long, sub-sessile on very short axillary branches. *Calyx-limb* truncate but with 5 distant minute teeth. *Corolla-tube* short, rather wide, hairy inside; limb with 5 broadly lanceolate sub-acute lobes longer than the tube. *Anthers* slightly exerted. *Stigma* with 2 elongate plano-convex lobes. *Fruit* pisiform, smooth, on a short pedicel. Hook. fil. Fl. Br. Ind. III, 160. *G. coriacea*, var.—, Miq. in. Ann. Mus. Lugd. Bat. IV. 244. *Paederia tetrandra*, Wall. Cat. 6249. ? *Psychotria*, Wall. Cat. 8385. *Rubiacea*? Wall. Cat. 8297.

SINGAPORE: *G. Thomson*; Ridley; King's Collector 319. MALACCA: *Maingay* (K.D.) 919; Griffith. PENANG: Wallich.—DISTRIB. Borneo, Sumatra.

3. GYNOCHTHODES MACROPHYLLA, Kurz in Journ. As. Soc. Beng. 1872, Pt. II, 314. Young branches angled, nearly as thick as a goose-quill, the bark pale. *Leaves* coriaceous, elliptic or elliptic-oblong, shortly

and abruptly acuminate or sub-acute, the base cuneate; upper surface very dark-brown and shining when dry, the lower paler and dull; main-nerves 6 or 7 pairs, spreading, slightly prominent on the lower surface scarcely visible on the upper; length 3.5 to 5.5 in.; breadth 1.35 to 2.5 in.; petioles .3 to .5 in.; stipules short, broad. *Flowers* .25 in. long, on thick short axillary pedicels. *Calyx*-tube almost globular; the limb cupular, as long as the tube, truncate. *Fruit* .5 or .6 in. in diam., pulpy, globose or broadly depressed-pyriform with 4 pyrenes (one often abortive). Kurz For. Flora Burm. II. 33: Hook, fil. Fl. Br. Ind. III. 160.

MALACCA: *Maingay* (K.D.) 934.

PERAK: *Ridley*; *Wray* 1156; *King's Collector* 5807.—DISTRIB. Andamans, Nicobars.

The Andaman specimens have darker narrower leaves than those from the Malay Peninsula.

#### 45. SPERMACOCE, Linn.

Herbs or small under-shrubs, usually with 4-angled branches. *Leaves* membranous or coriaceous, penni-nerved or longitudinally nerved; the stipules connate into a campanulate tube with a truncate bristly mouth. *Flowers* usually red or blueish, small or minute, solitary and axillary, or in axillary or terminal fascicles, heads or cymes, sometimes densely crowded. *Calyx* obovoid, or ovoid, the mouth with 2 or 4 persistent teeth often with interposed bristles or processes. *Corolla* funnel- or salver-shaped; the mouth with 4 valvate lobes. *Stamens* 4, inserted on the throat or tube of the corolla, filaments short or long. *Anthers* linear or oblong, included or excluded. *Disc* tumid or absent. *Ovary* 2-celled; each cell with a single ovule attached to the middle of the septum, amphitropous. *Style* filiform; stigma capitate or with 2 oblong arms. *Fruit* coriaceous or crustaceous, mericarps dehiscing variously. *Seeds* oblong or ovoid, grooved ventrally, the testa thin, embryo axile, cotyledons thin and broad.—DISTRIB. Species about 150, tropical and sub-tropical.

Leaves spatulate, obovate or bluntly oblong, the base narrowed, main-nerves 3 pairs, faint, hispid ...	...	1. <i>S. hispida</i> .
Leaves narrowly elliptic, tapering acutely to each end, main-nerves 3 or 4 pairs, very bold and prominent beneath	2.	<i>S. scaberrima</i> .
Leaves narrowly oblong-lanceolate, acute, pale beneath, main-nerves sub-obsolete ...	...	3. <i>S. stricta</i> .

1. SPERMACOCE HISPIDA, Linn. Sp. Pl. 102. Herbaceous, diffuse, spreading or sub-erect; stems half as thick as a goose-quill, acutely 4-angled and somewhat grooved when dry, sparsely and minutely



hispid, especially on the angles. *Leaves* sub-coriaceous, obovate, spatulate or oblong, sometimes elliptic, always blunt at the apex and tapering more or less to the base, continuous with the short, wide-cupular, pubescent bristle-bearing persistent stipules; upper surface reticulate (when dry), scaberulous, olivaceous, strigose; the lower pale, with spreading hispid hairs on the nerves; main-nerves about 3 pairs, rather straight, faint, oblique; length .35 to .75 in.; breadth .15 to .4 in. *Cymes* small, axillary, hardly longer than the stipules, 4- to 6-flowered. *Flowers* .4 in. long, sessile, with a few small membranous toothed bracteoles between them. *Calyx* small, densely silky, urceolate-campanulate, with 4 long narrow acute spreading lobes. *Corolla* three times as long as the calyx, salver-shaped, glabrous, the 4 broadly ovate teeth silky at their apices. *Stamens* about as long as the corolla-lobes; anthers oblong, filaments and style equal. *Stigma* large, transversely oblong. *Capsule* ovoid or sub-globular, sparsely hispid, crowned by the narrow, reflexed calyx-lobes, 2-celled with a single brown seed in each cell. DC. Prod. IV. 555; Roxb. Fl. Ind. I. 373; Wall. Cat. 825; W. & A. Prod. Fl. Penins. Ind. 438; Hook. fil. Fl. Br. Ind. III. 201; Trimen Fl. Ceyl. II. 371. *S. articularis*, Linn. fil. Suppl. 119; Roxb. Fl. Ind. l.c.; Wall. Cat. 827; W. & A. Prod. l.c.; Kurz Journ. As. Soc. Beng. 1877 II. 137. *S. scabra*, Willd. Sp. Pl. I. 572; Roxb. l.c. 371; Wall. Cat. 824. *S. hirta*, Rottb. in Nov. Ac. Berol. 1803, 95. *S. longicaulis*, Wall. Cat. 826. *S. avana*, Wall. Cat. 828. *S. ramossissima*, Wall. Cat. 829. *S. tubularis* Br. in Wall. Cat. 836.

In all the provinces: common.—DISTRIB. British India, Ceylon, S. China, Malaya Archipelago.

2. SPERMACOCE SCABERRIMA, Blume Bijdr. 946. Herbaceous, woody near the base; stems procumbent, much branched, thinner than a goose-quill, 4-angled, the angles with stiff reflexed small white hairs, otherwise glabrous and shining, dark-brown. *Leaves* olivaceous, coriaceous, narrowly elliptic, tapering acutely to each end, sessile, upper surface scaberulous, with a very few short white hairs; the lower paler, pilose on the midrib and nerves; main-nerves 3 or rarely 4 pairs, ascending obliquely, little curved, depressed on the upper surface and very prominent in the lower; length .5 to 1 in.; breadth .2 to .4 in. *Stipules* cupular, the mouth with 3 to 7 erect stiff bristles, glabrous. *Cymes* small, axillary, sessile, 4- to 8-flowered, condensed, .15 to .2 in. in diam. *Flowers* about .15 in. long, sessile or on very short pedicels, with short filiform bracteoles between them. *Calyx* oblong, constricted below the mouth, glabrous, the lobes lanceolate, slightly ciliate on the edges, spreading. *Corolla* not much exceeding the calyx, funnel-shaped, glabrous except for a few ciliae on the edges near the

base of the narrowly-lanceolate spreading lobes. *Stamens* exerted from the throat of the corolla but shorter than its lobes. *Anthers* oblong, the filaments rather long. *Style* about as long as the filaments; stigma large, thick, transversely oblong. *Capsule* slightly more than .1 in. long, oblong, crowned by the large spreading calyx-lobes, smooth, membranous, dehiscent, each cell containing a single oblong blunt black seed. DC. Prod. IV. 555; Miq. Fl. Ind. Bat. II. 331; Hook. fil. Fl. Br. Ind. III. 201. *S. longicaulis*, Br. in Wall. Cat. 826.

MALACCA: *Griffith*. SINGAPORE: *Ridley* 5897, 8954. PERAK: *Scortechini* 12, 64, 78, 602.—DISTRIB. Malay Archipelago.

3. SPERMACOCE STRICTA, Linn. fil. Suppl. 120. Herbaceous, erect, little-branched, pale-olivaceous when dry; branches as thick as a crow-quill, 4-angled and with 2 broad deep grooves, minutely hispid or sub-glabrous. *Leaves* sessile, coriaceous, oblong-lanceolate, acute, the base narrowed to the stipule; upper surface shining, glabrous or minutely hispid; the lower paler, dull, the midrib prominent and sometimes minutely hispid, nerves obsolete on both surfaces; length .75 to 1.25 in. *Stipules* conjoined to form a deep campanulate cup, the mouth acuminate or truncate but always with 6 to 8 long spreading bristles. *Flowers* .3 in. long, in clusters of 2 or 3, axillary, sessile subtended by a few pectinate bracteolates. *Calyx* campanulate, hispid outside, the mouth with 4 deep, lanceolate, acuminate, spreading lobes. *Corolla* much exerted beyond the calyx, tubular, with 4 deep, long, sub-erect lobes inflexed and sometimes hispid at the apex. *Stamens* slightly exerted; anthers sagittate, on long filaments. *Stigma* large, 2-lobed, as long as the stamens; style long filiform. *Capsule* oblong-obovoid, smooth, membranous, 2-celled, dehiscent, with a single black oblong seed in each cell. Roxb. Hort. Beng. 83; Fl. Ind. I. 370; DC. Prod. IV. 554; Kurz in Journ. As. Soc. Beng. 1877 II. 137. *S. lasiocarpa* Br. in Wall. Cat. 832. *S. pusilla*, Wall. in Roxb. Fl. Ind. ed. Carey & Wall. I. 379; Cat. 823; Don. Prod. 134. *S. filina*, *Gardneri* and *angustifolia*, Wall. Cat. 830, 834, 835. *S. triandra*, Ham. in Don. Prodr. 134. *Bigelovia stricta*, Blume Bijdr. 945. *B. lasiocarpa*. *Roxburghiana* & *Kleinii*, W. & A. Prod. 437. *B. myriantha*, Miq. Fl. Ind. Bat. II. 334. *Borreria pusilla*, DC., Prod. l.c. 543.

PENANG: *Curtis* 1936. MALACCA: *Goodenough* 1490. PAHANG: *Ridley* 1624.—DISTRIB. British India.

#### 46. PAEDERIA, Linn.

Twining, slender, foetid shrubs, glabrous or pubescent; the branches thin. *Leaves* opposite, rarely in whorls of three, membranous

petiolate, stipules broad, acuminate, deciduous. *Flowers* in axillary and terminal 2-3-chorotomously branched cymose panicles, with or without bracteoles. *Calyx-tube* campanulate or turbinate; the limb 4 or 5 toothed, persistent. *Corolla* funnel-shaped, its throat glabrous or villous; 4 or 5 lobes of the limb with inflexed crenulate margins, their apices sometimes 3-lobed, spreading. *Stamens* 4 or 5, linear-oblong, inserted in the tube of the corolla by very short filaments. *Ovary* 2-celled; stigmas 2, slender, twisted. *Ovules* one in each cell, basal, erect. *Fruit* compressed or globose, with thin shining fragile epicarp, separating early from the 2 pyrenes; pyrenes orbicular or ovoid, dorsally compressed, with or without wings, each containing a single dorsally seed with membranous testa adherent to the pyrene; cotyledons large, thin, cordate; radicle small, inferior.—DISTRIB. Species 10 to 12 mostly in tropical Asia, one in Brazil.

Fruit compressed, orbicular; pyrenes flat, winged, with radiating ridges on the dorsal surface:—

Leaves and the branches of the panicles always opposite ... .. 1. *P. foetida*.

Leaves and the branches of the panicles often in verticels of three ... .. 2. *P. verticellata*.

Fruit globular; pyrenes cupped, with neither marginal wings or dorsal ridges ... .. 3. *P. tomentosa*.

1. *PAEDERIA FOETIDA*, Linn. Mant. I. 52. Glabrous or puberulous; branches thinner than a goose-quill, dark-coloured and compressed when dry. *Leaves* ovate to lanceolate, the apex acute or apiculate, the base usually rounded or slightly cordate but sometimes cuneate; both surfaces cinereous or olivaceous-brown when dry, and finely reticulate, glabrous except for the occasional pubescence on the leaf nerves beneath and the tufts in their axils; main-nerves 4 or 5 pairs, oblique, faint; length 2 to 3·5 in.; breadth 1 to 1·5 in.; petioles ·5 to 1·5 in.; stipules broadly ovate-lanceolate, acuminate, often bifid, under ·1 in. in length. *Flowers* pink, ·35 in. long, shortly pedicellate, in lax spreading trichotomous (often scorpioid) cymes arranged in divergent axillary and terminal panicles from 3 to 15 in. long and usually bearing leaves like those of the stem but smaller; bracteoles minute, linear. *Calyx* less than ·1 in. long, campanulate, its mouth acutely 4- to 5-toothed. *Corolla* funnel-shaped, three times as long as the calyx, usually pubescent; the lobes of the limb crenulate, short, spreading only slightly. *Fruit* ·4 to ·5 in. across, orbicular; epicarp with 5 curved vertical veins in each side, thin, shining; pyrenes orbicular, with pale marginal wings, the centre with many bold radiating ridges on the dorsal surface, nearly smooth on the ventral. Wall. Cat. 6247, excl. E.; Roxb. Fl. Ind. I. 683; id. ed.



Wall. & Carey II. 517; W. & A. Prod. Fl. Pen. Ind. 424; Blume Bijdr. 968; DC. Prod. IV. 471; Griff. Notul. IV. 267; Ic. Pl. Asiat., t. 479, f. 3; Miq. Fl. Ind. Bat. II. 258; Miq. in Ann. Mus. Lugd. Bat. IV. 254; Hook. fil. Fl. Br. Ind. III. 195.

PERAK: *King's Collector* 1125, 4916, 7560; *Scortechini* 263. PAHANG: *Ridley* 1256. PENANG: *Curtis* 24. MALACCA: *Griffith*.—DISTRIB. British India, Malay Archipelago, Andaman Islands.

2. *PAEDERIA VERTICELLATA*, Blume Bijdr. 968. Glabrous except the lower surfaces of the leaves; branches thinner than a goose-quill, dark and slightly and bluntly 4-angled when dry. *Leaves* coriaceous, usually opposite but sometimes in whorls of three, lanceolate, ovate-lanceolate or elliptic, shortly acuminate, the base cuneate; both surfaces brown when dry, dull, the upper always glabrous, the lower often pubescent, the reticulations on the lower side rather distinct and transverse; main-nerves 6 or 7 pairs, curving, oblique, rather prominent on the lower surface; length 2.5 to 4 in.; breadth 1 to 1.75 in.; petioles 1 to 1.75 in.; stipules broadly triangular, short, very deciduous. *Flowers* .6 in long, funnel-shaped, shortly pedicellate in lax pedunculate branching cymes arranged in pairs or whorls of three in long narrow panicles, bracteoles minute. *Panicles* from 3 to 18 in. long, often bearing petiolate narrowly oblong leaf-like bracts .5 in. long; branches from .75 to 3 in. long, diverging, opposite or in whorls of three. *Calyx* less than .1 in. long, glabrous or puberulous, narrowly funnel-shaped, the mouth dilated and with 4 small triangular teeth or sub-truncate. *Corolla* tubular, constricted at the base, .6 in. long; the teeth less than .1 in. long, acute, erect. *Anthers* linear-oblong, apiculate, included in the corolla; their filaments nearly as long as themselves, dorsi-fixed. *Fruit* much compressed, orbicular, .4 to .5 in. across, with 5 curved vertical veins on each side; pyrenes as in *P. foetida*. DC. Prod. IV. 471; Miq. Fl. Ind. Bat. II. 259; Hook. fil. Fl. Br. Ind. III. 195; Ann. Mus. Lugd. Bat. IV. 255.

SELANGOR: *Ridley* 7416. MALACCA: *Maingay* (K.D.) 885. PERAK: *Scortechini* 446, 1573; *Wray* 3042; *King's Collector* 3177, 3736, 4457, 4780, 5316, 5410, 10613; *Curtis* 3182, 3340. SINGAPORE: *Ridley* 2835, 3647, 6469.—DISTRIB. Borneo.

3. *PAEDERIA TOMENTOSA*, Blume Bijdr. var. *GLABRA*, Kuz. Glabrous or sparsely pubescent; branches slightly thicker than a crow-quill, compressed and brown when dry. *Leaves* membranous, ovate to lanceolate; apex acute, base rounded or cuneate: both surfaces brown when dry, the lower paler and minutely reticulate, pubescent in the nerve axils; length 2.25 to 4 in.; breadth .85 to 1.5 in.; petioles .25 to 1 in.; stipules not connate, triangular, acuminate, less than .1 in. long. *Panicles* as

in *P. foetida* but shorter and less branched; the branches long (often 2·5 in.), diverging, markedly scorpid. *Flowers* ·5 in. long, secund, sessile or pedicellate on the same branch. *Calyx* ·1 in. long, narrowly campanulate, with 5 sharp teeth, glabrous. *Corolla* ·5 in. long, cylindric, the mouth with 5 short erect acute teeth, pubescent outside. *Fruit* ·2 to ·3 in. in diam., globular, shining, without veins, crowned by the small calyx; pericarp brittle, pale-brown when dry. *Pyrenes* cupular, without wings or ridges. DC. Prod. IV. 471; Miq. Fl. Ind. Bat. II. 258; Miq. in Ann. Mus. Lugd. Bat. II. 254; Hook. fil. Fl. Br. Ind. III. 197. *P. barbulate* Miq. in Ann. Mus. Lugd. Bat. IV. 255.

MALACCA: *Maingay* (K.D.) 886. PERAK; *Scortechini* 1376; *King's Collector* 6048.—DISTRIB. Malayan Archipelago.

The typical form of this has pubescence on the stems, under surfaces of the leaves and on the panicles. It is the form found in Burma and Assam. In our region only this variety *glabra* has as yet been collected. Except in the shape of its fruit and seeds this species differs little from *P. foetida*, Linn.

#### 47. SAPROSMA, Blume.

Shrubs, foetid when bruised, usually glabrous, often with subulate bristles at the apices of the branches and the bases of the peduncles. *Leaves* membranous, sometimes in whorls of 3 or 4; stipules usually connate into a 1- to 3-pointed sheath. *Flowers* small, white, axillary or terminal, solitary or in fascicles of about 3, sessile or pedicelled, or in pedunculate cymes; the bracteoles minute, often connate. *Calyx-tube* funnel-shaped; the limb dilated, 4- to 6-lobed or toothed; persistent. *Corolla* funnel-shaped or campanulate, the throat villous; the limb with 4 or 5 broad blunt lobes valvate in bud and with inflexed margins. *Stamens* 4, inserted on the throat, sessile or on short filaments; anthers more or less narrowly oblong. *Ovary* 2-celled; style filiform, with 2 short branches; ovules 1 in each cell, erect, basal. *Fruit* small, oblong or globose, containing 2 or (by abortion) 1 pyrene. *Seeds* elliptic and solitary, or two and plano-convex the plane surface not grooved; cotyledons small and leafy; radicle small, inferior.—DISTRIB. About 10 species, tropical Asiatic.

Flowers sessile in dense glomeruli ... .. 1. *S. glomerulatum*.

Flowers pedicelled, in cymes:—

Glabrous:—

Cymes about 1 in. long, laxly 3-flowered ... .. 2. *S. Scortechinii*.

Cymes from 1·5 to 3·5 in. long, more than 3-flowered,  
the branches lax, spreading ... .. 3. *S. ternatum*.

More or less pubescent... .. 4. *S. Ridleyi*.

1. *SAPROSMA GLOMERULATUM*, King & Gamble, n. sp. A shrub, very foetid when bruised; young branches thicker than a crow-quill,

compressed, brown when dry. *Leaves* thinly coriaceous, elliptic or ovate-elliptic, shortly and sharply acuminate, the base more or less cuneate, both surfaces brown when dry; the lower paler, dull, and with sparse transverse reticulations; main-nerves 6 to 9 pairs, pale and prominent on the lower surface like the midrib, depressed on the upper; length 3·5 to 7 in.; breadth 1·75 to 3 in.; petioles ·25 to ·4 in.; stipules cartilaginous, united into a short more or less persistent ring with some short bristly processes inside it. *Flowers* crowded, to the number of 4 or 5, in a multibracteate solitary glomerulus borne at the apex of a short branch between two leaves; the branch bearing in its lower third a pair of lanceolate bracts about ·5 in. long. *Female* glomerulus quite sessile, about ·3 in. long and ·4 in. broad; the male glomerulus somewhat larger than the female, borne on a short compressed peduncle ·4 to ·75 in. long and enveloped for the lower two-thirds of its length in a loose sheath formed of two acuminate partly conjoined bracts. The outer bracteoles of each glomerulus longer and thicker than the inner, broad, very concave, and forming a persistent involucre; the middle bracteoles broadly ovate-rotund with terminal caudate appendages; the inner ones narrower and embracing the flowers by pairs, appendiculate. *Flowers* sessile, about ·25 in. long. *Calyx* ·1 in. long, coriaceous, campanulate, the mouth truncate and with 4 or 5 minute distant acute teeth. *Corolla* salver-shaped, about ·2 in. long; the tube short and wide; the limb longer than the tube, with 4 broad blunt spreading lobes; anthers 4 to 6, linear-oblong. *Fruit* sessile, sub-globular, smooth, crowned by the small annular calyx, ·3 to ·35 in. in diam.; pericarp thick; seed solitary, sub-globular, hard.

PERAK: *Scortechini*; *Ridley* 9835; *King's Collector* 783, 6031, 8166. SINGAPORE: *Ridley* 10931. JOHORE: *Ridley* 4213.

The fruit when ripe is said to be blue, and the flowers variously pale-green or white.

VAR. *angustifolia*, King & Gamble: leaves rather more coriaceous than in the typical form, ovate-lanceolate, acuminate, 3 to 4 in. long and 1·25 to 1·4 in. broad.

MALACCA: *Goodenough* 1856. NEGRI SEMBILAN: *Ridley* 1856.

Flowers are absent in both the specimens cited here. When these are obtained, they may afford characters to separate this as a good species.

2. *SAPROSMA SCORTECHINII*, King & Gamble, n. sp. A shrub, glabrous except the midrib and nerves of the leaves on the lower surface; young branches thicker than a crow-quill, with pale-brown spongy bark. *Leaves* thinly coriaceous, elliptic, shortly and bluntly acuminate, the base cuneate; both surfaces brown when dry; the upper glabrous; the



lower puberulous on the midrib, otherwise glabrous, laxly reticulate; midrib bold on both surfaces; main-nerves 6 or 7 pairs, oblique, bold on the lower surface, faint on the upper; length 3·5 to 5·5 in.; breadth 1·5 to 2·5 in.; petiole ·2 to ·25 in. *Stipules* very short, connate into a sheath; mouth with short bristles. *Cymes* one to three at the apices of the branches, about 1 in. long (longer in fruit), laxly 3-flowered, the peduncle angled, puberulous, with small lanceolate bracteoles in whorls. *Flowers* ·5 in. long; their pedicels about the same. *Calyx* funnel-shaped; the mouth with 4 deep linear-lanceolate spreading lobes. *Corolla* twice as long as the calyx, tubular, expanding at the mouth; lobes 4, oblong, blunt; throat with a ring of hairs. *Stamens* 4, included. *Anthers* curved, oblong; their filaments attached to the tube. *Disk* conical. *Ovary* 2-celled, 2-ovuled. *Fruit* ellipsoid, smooth, ·65 in. long; the remains of the calyx ·2 in. long, blue when ripe. *Seed* solitary.

PERAK: *Scortechini* 511, 670; *Kings Collector* 4138, 5020.

3. *SAPROSMA TERNATUM*, Hook. fil. in Bth. & Hook. fil. Gen. Plant. II. 131; Fl. Br. Ind. III. 193. A glabrous shrub; young branches rather thinner than a goose-quill, pale when dry, compressed. *Leaves* often in whorls of three, thickly membranous, elliptic or elliptic-lanceolate, rarely oblanceolate-elliptic, shortly and rather abruptly acuminate, the base cuneate; both surfaces pale-brown when dry, the upper shining; the lower dull and paler; main-nerves 7 to 9 pairs, oblique, little curved, pale and prominent on the lower surface, the reticulations transverse and rather distinct on the lower surface only; length 4 to 8 in.; breadth 1·5 to 3·25 in.; petioles ·4 to ·6 in. long, with many short unequal bristles at their bases and inside the connate setosely-toothed stipules. *Cymes* solitary or fascicled, from 1·5 to 3·5 in. long, (longer in fruit) axillary, pedunculate, or branching from the base; the branches lax, spreading, sparsely flowered; the bracteoles few, linear. *Flowers* ·4 in. long, on pedicels varying from ·2 to ·6 in. long. *Calyx* ·1 in. long, shortly campanulate, the mouth wide and with 4 broad blunt teeth. *Corolla* ·3 in. long, salver-shaped, puberulous; the tube wide; the limb ·35 in. across with 4 or 5 broad reflexed lobes. *Fruit* ovoid or subglobular, crowned by the rather large calyx-teeth, ·35 in. in diam.; 1-seeded; seeds ellipsoid. Kurz. For. Fl. Burma II. 29. *Paederia ternata*, Wall. Cat. 6248 Roxb. Fl. Ind., ed. Carey & Wall., II. 520; DC. Prod. IV. 471. *Mephitidea* sp., Griff. Notul. IV. 267; Ic. Pl. Asiat. t. 476.

PERAK: *Scortechini* 1163; *Wray* 2262, 2907, 2929, 3943; *King's Collector* 1975, 2764, 3052, 4006, 4069, 6760, 8491. PAHANG: *Ridley* 2225. SELANGOR: *Ridley* 8236.—DISTRIB. Andaman Islands, Burma, Khasia Hills, Sumatra, Java.

4. *SAPROSMA RIDLEYI*, King & Gamble. A shrub? Young branches

compressed, thicker than a crow-quill, pale, glabrous below, pubescent or tomentose towards the apices. *Leaves* membranous, oblanceolate to elliptic, shortly and rather bluntly acuminate, the base much narrowed; both surfaces pale-brown when dry and minutely pitted; the upper glabrous and with the midrib channelled; the lower sparsely pubescent, the midrib densely so and prominent; main-nerves 7 to 10 pairs, spreading but curving upwards at their apices, thin but prominent below; length 3 to 3·75 in.; breadth 1 to 1·5 in.; petiole ·1 to ·15 in. *Stipules* connate, pale, coriaceous, forming a narrow cup pubescent outside at first, but ultimately glabrous, from less than ·1 to ·15 in. deep, irregularly toothed, persistent. *Cymes* axillary and terminal, less than half as long as the leaves, trichotomous, the branches 3- or more-flowered, often with 2 elliptic acute involucrel bracts at the base. *Flowers* ·25 in. long, their pedicels ·1 in. *Calyx* salver-shaped, ·15 in. long; the tube narrow, tomentose externally; the limb with 5 deep oblong blunt spreading or deflexed lobes; disk large. *Ovary* 2-celled, 2-seeded. *Corolla* and *Fruit* unknown.

SINGAPORE: *Ridley* 6474, only one specimen seen.

#### 48. HYDNOPHYTUM, Jack.

Glabrous epiphytic shrubs, with a dilated tuberous fleshy stem, simple or lobed and perforated by ants. *Leaves* coriaceous, elliptic, obtuse. *Flowers* small, sessile, axillary, solitary or in fascicles, white. *Calyx-tube* ovoid-cylindric, the limb truncate. *Corolla* salver or funnel-shaped; tube short, hairy inside; limb 4-lobed, valvate. *Anthers* 4, oblong, subsessile on the corolla-throat. *Ovary* 2-celled; stigma 2-lobed; ovules one in each cell, basal, erect. *Fruit* containing two coriaceous pyrenes surrounded by pulp. *Seeds* oblong, plano-convex, testa thin with dark lines, embryo in the centre of the fleshy albumen.—  
DISTRIB. 3 or 4 species in Malaya, N. Australia, Fiji.

HYDNOPHYTUM FORMICARIUM, Jack in Trans. Linn. Soc. XIV. 124. All parts glabrous. *Stem* tuber-like, smooth, several inches to a foot in diameter, bearing roots from its base and from its apex a few short branches as thick as a goose-quill and compressed near the nodes, pale and striate when dry. *Leaves* elliptic or elliptic-oblong, sometimes obovate, the apex obtuse, the base cuneate; both surfaces pale-brown when dry; the midrib distinct on both; the 6 or 7 pairs of ascending little-curved main-nerves slender on both surfaces and the reticulations obsolete; length 2·5 to 3·5 in.; breadth 1 to 2·5, petioles ·1 to ·2 in. *Flowers* few, ·25 in. long, sessile in axillary fascicles. *Calyx* widely campanulate with rounded base and truncate apex. *Corolla-tube* nearly twice as long as the calyx, wide, with 4 tufts of hair in the throat; limb about

half as long as the tube, with 4 broad oblong acute lobes, thickened at the apex. *Anthers* elliptic, on very short filaments inserted at the base of the tube. *Fruit* broadly ovoid, crowned by the cup-like remains of the calyx, glossy orange-red when ripe, about .2 in. long. Blume Bijdr. 956: DC. Prod. IV. 451; Kurz For. Flora Burma, II. 8; Hook. fil. Fl. Br. Ind. III. 194; Beccari Malesia II. t. XLVII. f. 1 to 11; XLVIII. f. 1 to 8. *H. montanum*, Blume and DC. ll. cc. *Lasiostoma formicarium*, Spreng. Syst. I. 423; Wall. Cat. 9055.

MALACCA: *Griffith* (K.D.) 2975; *Maingay* (K.D.) 864. PENANG: *Curtis* 2164. PERAK: *Scortechini* 934; *Wray* 2673; *King's Collector* 4994. JOHORE: *Ridley* 335, 2840. SINGAPORE: *Ridley* 1617.—DISTRIB. Cochin-China, Sumatra, Borneo.

#### 49. GEOPHILA, Don.

Small, slender, usually perennial, creeping herbs, glabrous or pubescent, the stems rooting. *Leaves* orbicular, reniform, ovate, often cordate, on long petioles. *Stipules* ovate, entire. *Flowers* small, solitary and subsessile or in pedunculate, bracteate, axillary or terminal umbels. *Calyx-tube* obovoid; its segments from 5 to 7, slender, persistent, spreading or reflexed. *Corolla* rather long, funnel-shaped, the throat hairy; lobes 4 to 7, valvate in bud. *Stamens* equal in number to the lobes. *Anthers* dorsifixed, linear; filaments thin. *Ovary* 2-celled; style slender, with 2 long or short branches: ovules erect, one in each cell. *Fruit* fleshy, with two plano-convex pyrenes. *Seeds* plano-convex, without any ventral groove; embryo minute, basal; radicle inferior.—DISTRIB. about 16 species, all tropical.

Leaves with broad, usually cordate bases:—

Flowers solitary, axillary:—

- |  |     |     |     |                             |
|--|-----|-----|-----|-----------------------------|
| Leaves glabrous, .5 in. long   | ... | ... | ... | 1. <i>G. humifusa</i> .     |
| Leaves hairy, .6 to 1 in. long   | ... | ... | ... | 2. <i>G. pilosa</i> .       |
| Peduncles with 1 to 3 flowers; leaves reniform to ovate-cordate, glabrous, .5 to 1.75 in. in length and breadth          |     |     |     | 3. <i>G. reniformis</i> .   |
| Peduncles with 6 to 9 flowers in an umbel; leaves glabrous, 1.75 to 3 in. long   | ... | ... | ... | 4. <i>G. melanocarpa</i> .  |
| Leaves with narrow bases never cordate, sparsely and minutely adpressed hairy, 1 to 1.5 in. long, peduncles few-flowered | ... | ... | ... | 5. <i>G. Scortechinii</i> . |

1. *GEOPHILA HUMIFUSA*, King & Gamble, n. sp. Stems very slender, glabrous, rooting at the nodes, often several feet long. *Leaves* thickly membranous, glabrous, in distant pairs, ovate-cordate, acute, the edges undulate when dry, .4 in. long and .25 in. broad, the petiole as long as the blade, main-nerve about 3 pairs, one pair basal; stipules



broad-ovate, 1 in. long. *Flowers* solitary, axillary, sub-sessile. *Fruit* as large as a currant, fleshy, bright-red.

PERAK: *Scortechini* 412.—DISTRIB. JAVA: on the Gedeh Volcano, King. SUMATRA: *Beccari* 44; *Forbes* 2059.

2. *GEOPHILA PILOSA*, H. H. W. Pearson in Hook. Ic. Plant., t. 2691. More slender than *G. reniformis*, the stem, leaves, peduncles and calyx with much stiff pubescence. *Leaves* broadly ovate-cordate, with sub-acute apices and slightly waved edges, both surfaces and petioles with pale stout curved hairs, the upper olivaceous, the lower paler green; main-nerves 3 pairs, much curved, spreading and ascending, rather distinct (when dry) on the lower; length .6 to 1 in.; breadth .35 to .65 in.; petioles .5 to 2 in. *Stipules* ovate, .1 in. long. *Peduncles* terminal, .5 to .8 in. long, tomentose. *Flowers* solitary, or 2 to 3 in an umbel with 2 lanceolate hairy bracts at its base. *Flowers* .25 in. long, subsessile. *Calyx*-tube cylindric, densely hairy, its lobes linear. *Corolla* tubular, with 5 deep ovate-acute teeth, pilose externally. *Fruit* sub-globular, black, crowned by the sub-coherent calyx-lobes, .3 in. in diam.

SINGAPORE: *Ridley* 9516.—DISTRIB. BORNEO: *Barber* 249.

3. *GEOPHILA RENIFORMIS*, Don. Prodr. 136. *Stem* as thick as a crow-quill, 6 to 18 in. long, glabrous, the branches short. *Leaves* broadly ovate-cordate to reniform, the apex sub-acute or obtuse; upper surface brown when dry, the lower paler, both glabrous, the main-nerves mostly radiating from the base of the midrib, 3 or 4 pairs, not prominent; length .5 to 1.5 in.; breadth .5 to 1.75 in.; petioles .35 to 2 in., often puberulous. *Stipules* small, semilunar, the apex reflexed. *Peduncles* slender, .5 to 2 in. long, slender, 1- to 3-flowered. *Flowers* .6 in. long, without pedicels, with lanceolate bracts at their bases. *Calyx*-lobes deep, narrowly lanceolate. *Corolla* much exceeding the calyx, its lobes lanceolate, glabrous or pubescent externally. *Berry* red, crowned by the calyx-lobes, sub-globular, .35 in. in diam. DC. Prod. IV. 537; W. & A. Prod., 436; Wight Icon. t. 54; Dalz. & Gibs. Fl. Bomb. 111; Miq. Fl. Ind. Bat. II. 311; Hook. fil. Fl. Br. Ind. III. 178. *G. diversifolia*, DC. l.c., Wall. Cat. 8325. *Psychotria herbacea*, Linn. Sp. Pl. 245; Roxb. Fl. Ind. I. 533. *Cephaelis herbacea*, Kurz in Journ. As. Soc. Beng. 1877, II. 140. *C. diversifolia*, Bl. Bijdr. 1004.

MALACCA: *Maingay* (K.D.) 927; *Goodenough* 1526. PERAK: *Scortechini* 130, 2183; *Wray* 3368; *King's Collector* 265, 905. PENANG: *Curtis* 1930; *Deschamps*. POONGAH: *Curtis* 3235. KEDAH: *Curtis*.—DISTRIB. Malayan Archipelago, Ceylon, British India, Andaman Islands, Polynesia, S. China, tropical America and Africa.

4. *GEOPHILA MELANOCARPA*, Ridley in Trans. Linn. Soc. (2) III. 313, t. 62. *Stems* 6 to 18 in. long, compressed, as thick as or thicker

than a crow-quill, glabrous. *Leaves* thickly membranous, oblong-ovate; slightly cordate at the base, the apex sub-acute, the edges slightly waved; both surfaces glabrous, pale olivaceous-brown, the reticulations, midrib, and 3 to 5 pairs of ascending main-nerves prominent; length 1.75 to 3 in.; breadth .75 to 1.5 in.; petiole 1 to 2.5 in.; puberulous. *Stipules* lanceolate, 1 in. long. *Peduncle* terminal, slender, .75 to 3 in. long, compressed, bearing an umbel of 6 to 9 flowers with an involucre of linear blunt bracts at its base. *Flowers* .6 in. long, on glabrous pedicels much shorter than themselves. *Calyx-tube* .25 in. long; its lobes longer, oblong, obtuse. *Corolla-tube* about .25 in. long, its lobes shorter, oblong, blunt. *Stamens* included. *Fruit* fleshy, broadly ovoid, black when ripe, shining, .35 in. in diam. and (including the persistent calyx-teeth) slightly longer; pyrenes .25 in. long, plano-concave with a ridge on each side.

PERAK: *Scortechini* 129; *King's Collector* 10134. MALACCA: *Ridley* 1608. SELANGOR: *Ridley* 8569.

5. GEOPHILA SCORTECHINII, King, n.sp. *Stem* prostrate, rather thicker than a crow-quill, obscurely 4-angled, 1 or 2 feet long; the branches short, erect. *Leaves* sub-fleshy, ovate or ovate-elliptic, base narrowed or rounded; both surfaces with sparse very minute white adpressed hairs; upper (when dry) pale-brown, the nerves indistinct; lower yellowish, the midrib and the 3 or 4 pairs of much curved ascending nerves slightly prominent; length 1 to 1.5 in.; breadth .6 to .9 in.; petioles .35 to .75 in. *Peduncles* terminal, about as long as the leaves, slender, compressed, bracteate, dichotomous near the apex and bearing two small linear bracts at each bifurcation. *Flowers* few, on short bracteolate pedicels, .6 in. long (to the end of the long style). *Calyx* with a long narrow tube, and 5 long linear acuminate lobes puberulous outside. *Style* very long, filiform.

PERAK: *Scortechini*.

#### CEPHAELIS, Swartz.

Undershrubs or perennial herbs, usually erect. *Leaves* oblanceolate, obovate or oblong; stipules usually solitary, connate at the base (in the Malayan species) *Flowers* in involucrate heads. *Calyx* with a funnel-shaped tube and (in the Malayan species) an entire persistent limb. *Corolla* funnel-shaped or salver-shaped, its throat naked or hairy; lobes of the limb 4 or 5, erect or spreading, valvate. *Stamens* 4 or 5, inserted in the mouth of the corolla-tube, usually shortly exerted. *Anthers* oblong or linear, dorsifixed. *Ovary* 2-celled (rarely 3- or 4-celled). *Style* long or short. *Ovules* 1 in each cell, basal, erect. *Fruit* dry or fleshy, of two plano-convex pyrenes. *Seeds* plano-convex, their

testa membranous, albumen horny. *Embryo* small, basal, the cotyledons leafy.—**DISTRIB.** Species about 70, all tropical.

Stipules coriaceous, their bases coriaceous and leaving bold scars on the stem:—

Capitula sessile, 1 to 3 in. across; leaves 3 to 5 in. broad;

stipules broadly ovate, .8 in. long ... .. 1. *C. Griffithii*.

Capitula pedunculata, .75 to 1 in. across; leaves .5 to 3.5

in. broad; stipules coriaceous, broadly ovate with dis-

coloured edges, .1 to .5 in. long ... .. 2. *C. cuneata*.

Stipules not coriaceous, leaving no scars on the stem ... .. 3. *C. Ridleyi*.

1. **CEPHAELIS GRIFFITHII**, Hook. fil. Fl. Br. Ind. III. 178. Young branches thicker than a swan-quill, lenticellate. *Leaves* membranous, oblong-oblancoelate, shortly and rather abruptly acuminate, gradually narrowed from above the middle into the long slightly winged petiole, both surfaces glabrous, brown when dry, the lower the paler; main-nerves 12 to 20 pairs, curving upwards, prominent like the midrib on the lower surface, rather faint on the upper surface when dry; length 10 to 16 in.; breadth 3 to 5 in.; petioles 2.5 to 3 in. *Stipules* coriaceous, sub-orbicular, their apices sub-acute, .8 in. long, the margins entire, thin, and discoloured. *Capitulum* sub-globular, from 1 to 2 in. in diam., sessile or shortly stalked, bearing numerous orbicular brates like the stipules, but smaller. *Flowers* .75 in. long, on short pedicels. *Calyx* .15 in. long, the tube narrow-cylindric; the mouth abruptly campanulate, entire, truncate. *Corolla* funnel-shaped, .65 in. long, mouth with 5 ovate-acute reflexed lobes. *Fruit* .35 in. long, compressed, slightly grooved along the edges, with a broad dorsal rib on each side, crowned by the calyx-limb. *Seed* thin.

MALACCA: *Griffith* (K.D.) 3032; *Maingay* (K.D.) 928. NEGRI SEMBILAN: *Ridley* 10109. PERAK: *King's Collector* 746, 2534, 6251, 6399, 10782; *Wray* 1197, 1338, 3027; *Ridley* 9755; *Scortechini*.—**DISTRIB.** SUMATRA: *Forbes*, 2511.

Differs from *C. cuneata* in the longer and sessile capitulum and somewhat larger leaves and stipules.

2. **CEPHAELIS CUNEATA**, Korth. in Ned. Kruidk. Arch. II. 248. A shrub; young branches thinner than a goose-quill, glabrous, the nodes sometimes close together and always marked by the pale coriaceous bases of the deciduous stipules. *Leaves* thickly membranous, oblanceolate or elliptic-oblancoelate, gradually narrowed from above the middle into the slightly winged petiole; both surfaces glabrous, olivaceous when dry, the lower the paler; main-nerves 10 to 18 pairs, curved, spreading and ascending, indistinct on the upper surface when dry but distinct on the lower, the midrib broad; length from 5 to 10 in.; breadth 1 to 2.5 in.; petioles narrowly winged, .5 to 1.5 in. long. *Stipules*



coriaceous, broadly ovate and about .5 in. long or forming small shallow, cups .1 in. deep always with more or less broad discoloured edges. *Capitulum* pedunculate, from .8 to about 1.25 in. in diam. enveloped in thickly membranous, veined, involucre bracts, the inner being mostly orbicular-oblong but the two or three lower (external) elongate-oblong and connate; the peduncle from 1 to 3 in. long, ebracteate. *Flowers* .75 in. long. *Calyx* only .15 in. long, cylindric but widening slightly at the truncate apex. *Corolla* .65 in. long, infundibuliform, the mouth with 5 short triangular reflexed lobes. *Anthers* linear-oblong, their apices slightly exerted. *Disk* large and deep. *Style* longer than the anthers; stigma fleshy, 2-lobed, exerted. *Fruit* .4 in. long, compressed, deeply grooved on the edges and with a stout dorsal ridge on each side, crowned by the calyx.

MALACCA: *Griffith* (K.D.) 3085; *Goodenough* 1979; *Derry* 609; *Maingay* (K.D.) 929; *Hullett* 790. SINGAPORE: *Ridley* 4966. JOHORE, *King*; *Ridley* 3733, 6405. PAHANG: *Ridley* 2198. PERAK: *Scortechini* 343; *Ridley* 2924; *King's Collector* 1104, 6218; *Wray* 1497, 1977.

Sir Joseph Hooker considers *C. cuneata*, Korth. to be a species, and in deference to his opinion we have kept it up. The two chief characters, on which he relies to separate it from *C. Griffithii* are the pedunculate inflorescence and the narrower leaves. But, in a large suite of specimens, these break down, for there are specimens in which distinct peduncles are associated with the broadly oblanceolate leaves of *C. Griffithii*. A third and minor character used to separate the two is the size of the stipules,—those of *C. Griffithii* being 1 in. in diam., and those of *C. cuneata* only .25 in. But, here again, there are numerous variations which do not fit in as distinctive marks with the other two characters. I think it might be better to treat *C. cuneata* as a variety of *C. Griffithii*, referring to it (amongst the specimens cited above) only *Griffith* 3085, *Maingay* 929 and *Hullett* 796.

3. CEPHAELIS RIDLEYI, King, n. sp. Like *C. Griffithii*, but with rather narrowly elliptic leaves, tapering to each end, the main-nerves faint and only 8 to 10 pairs, 8 or 9 inches in length and from 2.5 to 3 in. in breadth; stipules lanceolate not coriaceous, the capitules shortly trichotomous, 2.5 to 3 in. in diam. on thick peduncles 1 in. long, subtended by two boat-shaped bracts 1.35 in. long, flowers shorter than the lanceolate inner bracteoles.

SINGAPORE: *Ridley* 9515; *Yapp* 433. PENANG: *Curtis*. SELANGOR: *Ridley* 7417.

#### 51. LASIANTHUS, Jack.

Shrubs or small trees, often foetid, with terete branches often compressed at the nodes. *Leaves* distichous, more or less acuminate (often very much so), the veins transverse and often distinct; stipules usually broad. *Flowers* small, in axillary, often bracteate, sessile (rarely pedun-

eled), fascicles on condensed cymes. *Calyx-tube* short; the limb with 3 to 5 long or short persistent teeth, sometimes truncate. *Corolla* funnel- or salver-shaped, its throat villous; the limb with 3 to 7 valvate lobes. *Stamens* 4 to 6, inserted by short filaments on the throat, often apiculate, included. *Style* long or short, stigmas 3 to 9, short, blunt; ovules 1 in each cell, basal, erect, usually linear. *Drupe* small, containing 3 to 9 triquetrous 1-seeded pyrenes. *Seeds* narrow, with membranous testa; embryo terete; radicle slender, inferior.—**DISTRIB.** About 50 species, mostly tropical Asiatic.

A genus resembling in *facies* *Urophyllum*; but distinguished from that by its 1-seeded pyrenes and deeply-lobed, not truncate, calyx-limb; also by its larger stipules, and shorter corolla-tube.

Flowers 4-5-merous:—

Glomeruli hemispheric, sessile, not longer than the petioles; bracts and flowers numerous:—

Glomeruli partially or entirely covered (at least when young) by the persistent, often coriaceous, stipules; leaves usually more than 8 in. long; bracts longer than the flowers (except in No. 43, *VAR.*):—

- |  |                          |
|--|--------------------------|
| Leaves elliptic-oblong, hispidulous on both surfaces   | 1. <i>L. scabridus.</i>  |
| Leaves oblanceolate, glabrous on the upper surface, pubescent (usually minutely so) on the lower ... | 2. <i>L. Griffithii.</i> |
| Leaves oblong-lanceolate, glabrous on both surfaces  | 3. <i>L. stipularis.</i> |

Glomeruli not covered by the more or less deciduous stipules, bracts longer than the flowers:—

- |  |                            |
|--|----------------------------|
| Bracts unequal, diminishing in size inwards; the outer ovate-lanceolate often 1 in. long; the inner lanceolate or linear; pubescence of leaves rusty ...                   | 4. <i>L. cyanocarpus.</i>  |
| Bracts uniform, all linear and densely hispid; leaves oblong-lanceolate, thickly coriaceous, rugulose and glabrous on the upper surface; the lower softly pubescent ... .. | 5. <i>L. rhinocerotis.</i> |
| Bracts uniform, all broad; leaves membranous; pubescence of leaves yellowish... ..   | 6. <i>L. inæqualis.</i>    |

Cymes twice as long as the petioles with few flowers and few linear hirsute bracts shorter than the flowers; leaves coriaceous, elliptic-lanceolate acute, glabrous above (except the midrib), softly hairy and reticulate below, main-nerves 11 to 13 pairs; pyrenes 5 to 7 ... ..

7. *L. pilosus.*

Cymes not much longer than the petioles with few flowers but many linear softly hairy bracts longer than the flowers; leaves membranous, narrowly elliptic, somewhat oblanceolate, quite glabrous above; main-nerves 8 or 9 pairs ... ..

8. *L. Ridleyi.*

Cymes about as long as the petioles with few flowers and many linear pubescent bracts shorter than the flowers; leaves thinly membranous, narrowly elliptic acuminate, glabrous above and minutely pubescent beneath; main-nerves 5 or 6 pairs; pyrenes 4 ... 9. *L. flavicans.*

Cymes shorter than the petioles, few-flowered, bracts few :—  
Leaves 8 to 10 in. long :—

All parts quite glabrous; bracts small, fimbriate  
leaves 4·5 to 6 in. long ... .. 10. *L. longifolius.*

Leaves pubescent at least below, more or less  
oblanceolate, bracts linear :—

Main-nerves of leaves 4 pairs ... .. 11. *L. constrictus.*

Main-nerves of leaves 6 to 8 pairs—

Stipules linear, hirsute, as long as the petioles;  
calyx '1 in. long; corolla '3 in. long, its lobes  
narrow ... .. 12. *L. singaporensis.*

Stipules triangular, sub-acute or bifid; calyx  
'25 in. long; corolla shorter than the calyx, its  
lobes oblong, blunt ... .. 13. *L. ellipticus.*

Leaves elliptic-ovate, tapering to each end, nearly  
glabrous; main-nerves 4 to 6 pairs, faint like the  
reticulations; bracts linear; flowers under '1 in. long 14. *L. subspicatus.*

Leaves oblong-lanceolate; main-nerves 5 pairs, as-  
cending, the reticulations horizontal, strong, puber-  
ulous on the under surface; bracts broad; flowers '15  
in. long ... .. 15. *L. Wrayi.*

Leaves oblong, acute at both ends, under surface pu-  
bescent everywhere; main-nerves 6 or 7 pairs, as-  
cending; bracts oblong, acuminate, flowers '3 in. long. 16. *L. Kurzii.*

Leaves 2 to 4 in. long, much narrower than long :—

Bracts of cymes large, broadly ovate to elliptic ... 17. *L. sub-inæqualis.*

Bracts of cymes linear :—

Upper surfaces of leaves quite glabrous; calyx-lobes  
crowning the fruit, '25 in. long; pyrenes 5 ... 18. *L. coronatus.*

Upper surfaces of leaves glabrous except for a few  
hairs on the midrib; calyx teeth on the fruit short:  
pyrenes 8 ... .. 19. *L. appressus.*

Upper surfaces of leaves glabrous except the cinere-  
ous-tomentose midrib; under surfaces minutely pi-  
lose; bracts of cyme lanceolate or oblanceolate, taper-  
ing to each end; flowers 4-merous ... .. 20. *L. attenuatus.*

Both surfaces of the leaves and all parts of the plant  
with coarse flexuose hairs with bulbous bases; bracts  
of cyme linear, hispid; flowers 5-merous ... 21. *L. densifolius.*

Cymes ebracteate, sessile, shorter or rarely a little longer  
than the leaf-petioles :—

Leaves quite glabrous on both surfaces :—



Leaves 7 to 12 in. long and 2·5 to 3·5 in. broad:—

Lower surfaces of leaves at first puberulous, afterwards quite glabrous, their main-nerves 16 to 20 pairs; stipules ·4 in. long, coriaceous, sagittate; calyx shortly campanulate, ·1 in. long, obscurely 4- or 5-toothed; fruit sub-globular, glabrous, 6-ridged; pyrenes 5 or 6 ... .. 22. *L. robustus.*

Lower surfaces of leaves always quite glabrous; main-nerves of leaves 10 to 12 pairs; stipules ·2 in. long, triangular, acuminate; calyx ·15 in. long, widely tubular, the mouth truncate, fruit hairy; pyrenes 4 ... .. 23. *L. coriaceus.*

Main-nerves of leaves 10 pairs; stipules ·15 in. long, broadly triangular with abrupt oblong apices; calyx ·25 in. long, tubular, the mouth truncate but obscurely 4-toothed ... .. 24. *L. pergamaceus.*

Leaves 3·5 to 6 in. long:—

Leaves elliptic or oblanceolate-elliptic, 1·35 to 2·5 in. broad; main-nerves 5 pairs; fruit ellipsoid, 4-ridged, ·45 in. long; pyrenes 4, rugulose ... .. 11. *L. constrictus.*

Leaves oblong-lanceolate, 1 to 1·4 in. broad; main-nerves 8 or 9 pairs; fruit sub-globose, ·2 in. in diam.; pyrenes 4, smooth ... .. 25. *L. malaccensis.*

Leaves quite glabrous on both surfaces except for a few adpressed hairs on the lower part of the midrib on each, elliptic-oblong, sharply acuminate, 5 to 6·5 in. long and 1·5 to 2 in. broad; main-nerves 8 or 9 pairs... 26. *L. chinensis.*

Leaves glabrous on both surfaces except the midribs and 10 to 13 pairs of main-nerves, adpressed-puberulous on both, elliptic-oblong, 3 to 4·25 in. long and 1·25 to 1·5 in. broad ... .. 27. *L. Wightianus.*

Leaves quite glabrous above, minutely sub-strigose below, elliptic or oblong-elliptic, bluntly acuminate or sub-acute:—

Leaves with 10 or 12 pairs of main-nerves ... 28. *L. pterospermus.*

Leaves with 3 or 4 pairs of main-nerves... 11. *L. constrictus.*

Leaves glabrous on the upper surface, the lower sparsely pilose everywhere ... .. 7. *L. pilosus*  
VAR. *angustifolius*

Leaves glabrous on the upper surface, the lower hairy on the midrib and main-nerves:—

Leaves 6 to 10 in. long, elliptic or obovate-elliptic; main-nerves 7 or 10 pairs ... .. 29. *L. perakensis.*

Leaves 3 to 7 in. long:—

Leaves narrowly oblong-lanceolate, five or six times longer than broad, their apices caudate-acuminate:—

Neither surface of leaves scaly; main-nerves 12 to 14 pairs; cymes 2-to 3-flowered; mouth of

- calyx with 5 triangular acuminate lobes; corolla tubular, its lobes pubescent; pyrenes 4 or 5 ... 30. *L. angustifolius.*
- Both surfaces of leaves minutely scaly; main-nerves about 7 pairs; cymes 5-to 7-flowered; mouth of calyx truncate, entire; corolla salver-shaped, the lobes densely hirsute; pyrenes 7 or 8 ... 31. *L. oblongus*
- Leaves 5 or 6 in. long, oblong, sub-acute or shortly and bluntly acuminate; under surfaces sub-glabrous between the 9 to 11 pairs of adpressed-tomentose main-nerves and veins; calyx cupular-campanulate with 5 triangular teeth ... 7. *L. pilosus.*
- Leaves 3 to 4.5 in. long, ovate-lanceolate, shortly acuminate; under surface glabrous except the pubescent midrib and 5 or 6 pairs of pubescent main-nerves; calyx with 5 long unequal linear-lanceolate lobes ... 32. *L. montanus.*
- Leaves 2.5 to 3.5 in. long, lanceolate or elliptic-lanceolate, long-acuminate; under surface softly pubescent on the 4 to 6 pairs of main-nerves; calyx with 5 sub-equal linear-lanceolate lobes; fruit sub-globular, sparsely pilose; pyrenes 5 ... 33. *L. Curtisii.*
- Leaves never more than 3 in. long, elliptic-lanceolate, acuminate, glabrous above, reticulate beneath and adpressed-puberulous on the 6 or 7 pairs of bold main-nerves; calyx-lobes 5, linear-lanceolate, unequal ... 34. *L. pseudo-lueidus.*
- Leaves never more than 1.5 in. long, oblong-lanceolate, acute or sub-acute, glabrous except the lower surfaces of the 6 to 8 pairs of minutely adpressed-puberulous main-nerves; calyx-teeth short triangular; pyrenes 4 ... 35. *L. nervosus.*
- Leaves scaberulous on the upper surface, the lower scabrid-puberulous between the softly puberulous 4 to 6 pairs of main-nerves, elliptic or ovate-elliptic, 4 to 5 in. long; calyx narrowly campanulate ... 36. *L. Harveyanas.*
- Leaves sparsely clothed with stiff bulbous hairs on the upper surface, the lower with more numerous shorter hairs, oblong-lanceolate, much acuminate; main-nerves 16 to 18 pairs; calyx with 5 deep lanceolate lobes ... 37. *L. ferrugineus.*
- Leaves sparsely and minutely strigose on the upper surface, pilose on the lower, but the 7 to 10 pairs of main-nerves and the midrib tomentose on the latter surface; length 2.5 to 3.5 in.; calyx campanulate with sub-truncate obsolete toothed mouth ... 38. *L. tomentosus.*
- Inflorescence solitary, on peduncles much exceeding the petioles in length:—
- Peduncles rather short, 3- to 5-flowered; leaves

- narrowly elliptic-oblong, coriaceous, 4 to 5 in. long ; almost glabrous, the reticulations bold and horizontal 39. *L. scalariformis.*  
 Peduncles filiform, 1- to 2-flowered ; leaves 2 to 3 in. long, sessile or nearly so, broad and unequal at the base ; both surfaces more or less hispidulous-pubescent ... 40. *L. filiformis.*  
 Peduncles filiform, 1- to 3-flowered, leaves under 1 in. long, petiolate, sub-rhomboidal or ovate ; glabrous except sometimes the midrib at its base on the lower surface ... 41. *L. gracilis.*

## Flowers 3-merous :—

- Calyx and corolla 3-cleft ; anthers and pyrenes each 3 :—  
 Leaves 5·5 to 8·5 in. long, narrowly elliptic or sub-obovate-elliptic, usually glabrous ; reticulations distinct, especially below, as are the 5 or 6 pairs of main-nerves ; flowers puberulous ; fruit obliquely elliptic ... 42. *L. Mainyayi.*  
 Leaves 3·5 to 6 in. long, oblong-elliptic or lanceolate, everywhere glabrous ; reticulations and 7 to 10 pairs of main-nerves faint ; fruit depressed-trigonous or subdidymous ; pyrenes with a transverse partition and thus falsely 2-celled ... 43. *L. lucidus.*

1. *LASIANTHUS SCABRIDUS*, King & Gamble, n. sp. Young branches about as thick as a goose-quill, glabrous, black when dry. *Leaves* coriaceous, oblong or oblong-elliptic, shortly acuminate, the base narrowed and usually slightly unequal ; both surfaces pale-brown when dry, rugulose reticulate, scaberulous from numerous short stiff hairs with large bulbous bases, the midrib prominent and hirsute, the main-nerves and veins depressed, under surface with non-bulbous hairs longer and softer than those of the upper ; the midrib and 10 to 13 pairs of curved spreading main-nerves hirsute like the midrib ; length 4·5 to 8 in. ; breadth 1·35 to 2·35 in. ; petiole ·5 to ·7 in. ; hirsute ; stipules broadly triangular-acute or obtuse, thickly coriaceous, glabrous, ·4 or ·5 in. long, and nearly as broad, persistent. *Glomeruli* somewhat shorter than the petioles, sessile, dense, many-flowered, partly covered by the stipules when young, bearing very numerous linear obtuse bracts, black, glabrous and shining on their posterior surface, but on the edges and in part covered with coarse bristly hairs. *Flowers* few, sessile, much shorter than and concealed amongst the bracts. *Calyx* narrowly campanulate with a glabrous tube, and 5 lanceolate pubescent lobes. *Fruit* glabrous, except the persistent calyx-lobes, about ·2 in. long ; pyrenes 5, rugulose.

JOHORE : Ridley 6463, 11170, 7112.

2. *LASIANTHUS GRIFFITHII*, Wight in Calc. Journ. Nat. Hist. VI, 505. Young branches as thick as a swan's-quill, terete below but compressed in the very young parts, sparsely and deciduously pubescent, ultimately sub-glabrous, dark-coloured when dry. *Leaves* large, thickly



coriaceous, oblanceolate-elliptic, shortly acuminate, the base acute; both surfaces pale-brown tinged with olivaceous; the upper quite glabrous, often rugulose from the depression of the nerves and reticulations; the midrib not depressed but channelled near the base; under-surface paler, the bold midrib, nerves and veins, and their interspaces in a less degree pubescent; length 8 to 12 inches; breadth 3 to 4 in.; petioles .3 to .5 in., winged above; stipules broadly triangular, obtuse or acute, coriaceous, partly covering the inflorescence when young, more or less persistent. *Glomeruli* somewhat longer than the petioles, hemispheric, condensed, many-flowered; flowers sessile, .2 in. long, imbedded amongst numerous linear densely hirsute bracts somewhat longer than themselves. *Calyx* tubular-campanulate or campanulate, narrowed to the base, glabrous except the hirsute ovate or lanceolate lobes. *Corolla* in the perfect flowers .3 in. long, salver-shaped, the tube narrow, glabrous except the villous throat; the limb with 5 narrowly lanceolate hirsute reflexed lobes. *Anthers* 5, exerted beyond the dense villous hairs of the throat, linear-oblong; filaments short. In *cleistogamic flowers* (which are numerous) the corolla smaller than the calyx but resembling it, 5 or 6 lobed. *Fruit* glabrous, ovoid, crowned by the slightly accrescent calyx-lobes, about .2 in. long; pyrenes 5. Hook. fl. Fl. Br. Ind. III. 179.

MALACCA: *Griffith* (K.D.) 2935. JOHORE: *Ridley* 11177, 11179. SINGAPORE: *Ridley* 4121. PERAK: *King's Collector* 496.—DISTRIB. Borneo; *Haviland* 84.

VAR. *latibracteata*, King & Gamble; bracts of inflorescence broad, obtuse, glabrous outside, hirsute inside, shorter than the flowers, often becoming thick, white and polished when old, persistent.

SELANGOR: *Ridley* 10196. PERAK: *Ridley* 9528; *Scortechini* 612.

3. LASIANTHUS STIPULARIS, Blume Bijdr. 997. A slender shrub 3 to 6 feet high; all parts except the bracts and lobes of corolla inside glabrous: young branches half as thick as a goose-quill, dark-coloured when dry, smooth. *Leaves* membranous, oblong-lanceolate, shortly and rather abruptly cordate-acuminate, narrowed from below the middle to the short petiole; both surfaces pale-brown when dry, glabrous, the upper shining; main-nerves 9 to 12 pairs, curved, rather distinct on both surfaces, the midrib grooved on the upper, prominent on the lower surface; the main-nerves distinct on both; length 5 to 7 in.; breadth 1.5 to 2 in.; petioles .25 to .35 in. long. *Stipules* broadly ovate-cordate, sub-acute, .5 to .6 in. long, completely covering the inflorescence. *Flowers* nearly .3 in. long, on very short flat pedicels, surrounded by numerous unequal narrowly lanceolate densely hirsute bracts longer than themselves. *Calyx* campanulate, ridged; the mouth with 4 or 5 broadly triangular acute teeth. *Corolla* thrice as long as the calyx; the tube

cylindric; the lobes 4 or 5, oblong, blunt, villous inside. *Stamens* 4 or 5, on short compressed filaments; anthers oblong, their tips exerted. *Fruit* ovoid-glabose, sub-ligneous, glabrous, with 8 to 10 vertical ridges, crowned by the calyx-lobes, .25 in. long, and .2 in. in diam., 4- or 5-celled, with a single compressed erect seed in each cell. Kurz Fl. Burm. II. 32. Hook. fil. Fl. Br. Ind. III. 179. *Mephitidia stipularis*, DC. Prod. IV. 453.

SINGAPORE: *Ridley* 4903, 6559, 10419; *King*. SELANGOR: *Ridley* 8230, 8575. PERAK: *Scortechini* 213; *Wray* 2019; *Ridley* 9743; *King's Collector* 340.—DISTRIB. Malay and Andaman Archipelagos.

4. *LASIANTHUS CYANOCARPUS*, Jack in Trans. Linn. Soc. XIV. 125. A shrub 6 to 8 feet high; all parts more or less tawny- or rusty-hirsute, the hairs shining and often flexuose; young branches half as thick as a goose-quill. *Leaves* coriaceous, oblong, oblong-elliptic or oblanceolate-oblong, shortly acuminate, the base somewhat narrowed, unequal-sided; upper surface dark olivaceous-brown when dry, the lower paler with the transverse veins distinct; main-nerves 7 to 10 pairs, curved, spreading and ascending, bold on the lower surface, depressed on the upper when dry; length 4.5 to 6.5 in.; breadth 1.65 to 2.25 in.; petioles .15 to .25 in. *Stipules* narrowly triangular, acuminate, .2 in. long. *Cymes* sessile, shorter than the petioles, enveloped by a number of densely hirsute bracts diminishing in size inward; the outer ovate-lanceolate acuminate and often 1 in. or more in length; the inner much smaller, lanceolate or linear. *Flowers* only 3 or 4, sessile, concealed amongst the numerous bracts, only about .25 in. long and shorter than even the innermost bracts. *Calyx* longer than or about as long as the corolla, campanulate, with 4 or 5 long narrow hirsute lobes. *Corolla* tubular, glabrous inside; its lobes oblong, blunt. *Anthers* oblong, blunt, almost sessile. *Fruit* ovoid-globular, glabrous, but crowned by the long hirsute calyx-lobes, .2 to .25 in. long, separating into 4 or 5 three-sided, one-seeded pyrenes. Kurz For. Fl. Burma, II. 32; Hook. fil. Fl. Br. Ind. III. 179. *L. bracteatus* and *L. Roxburghii*, Wight in Calc. Journ. Nat. Hist. VI. 501, 502. *L. oculus-Cati*; Miq. Fl. Ind. Bat. II. 315. *L. laevicaulis*, Kurz in Trimen's Journ. Bot. 1875, p. 327. *Lasianthus*? Wall. Cat. 8440. *Mephitidia cyanocarpa*, DC. Prod. IV. 452. *M. rhinozerotis*, Kurz in Andaman Report, Append. A. 40; (not of Blume?). *Triosteum hirsutum* Roxb. Fl. Ind. I. 538. *Rubiacea*, Wall. Cat. 8305.

In all the Provinces, common.—DISTRIB. British India, Malay Archipelago.

VAR. *subsesilis*; petioles only about .1 in. long, bases of leaves oblique.

PERAK: *Ridley* 9730; *King's Collector* 472; *Scortechini* 1207.

Wall. Cat. 8440 belongs here.

5. *LASIANTHUS RHINOCEROTIS* Blume Bijdr. 996. A shrub or small tree; young branches rather thinner than a goose-quill, covered like the petioles with dense short rusty-tomentum. *Leaves* coriaceous, narrowly oblong-lanceolate, acute, the base rounded; upper surface glabrous, the midrib depressed when dry, the nerves depressed, the veins inconspicuous; lower surface everywhere hairy, the 10 to 12 bold oblique ascending little-curved main-nerves and the stout midrib tomentose; the prominent transverse veins pubescent and the interspaces puberulous; length 4 to 7 in.; breadth 1.5 to 2.25 in.; petioles .25 in. long; stipules broadly triangular acute, pilose, .1 to .2 in. long. *Glomeruli* sessile or on short pedicels, axillary, bearing very numerous narrow bracts, the outer linear, the inner subulate, all softy rusty-pilose, mostly .5 or .6 in. long, the inner sometimes shorter. *Flowers* much shorter than the bracts and concealed by them, few, sessile or subsessile. *Corolla* with 5 deep concave lobes, pilose outside. *Fruit* ovoid, pointed, blue, about .15 in. long, separating into 5 three-cornered pyrenes. Miq. Fl. Ind. Bat. II. 315. *Mephitidia rhinocerotis* DC. Prod. 453; Korthals in Ned. Kruidk. Arch. II. 220.

PERAK: at elevations of 4500 feet and upwards. *Scortechini* 532, 537; *Wray* 237; *King's Collector* 3209, 3809. SELANGOR: *Kelsall* 1993. —DISTRIB. Java.

Closely allied to *L. crinitus* Jack, but differing in the characters of the hairs and bracts. In that species the outer bracts are much longer than the inner; in this the outer bracts are not longer and only slightly broader than the inner.

6. *LASIANTHUS INAEQUALIS*, Blume Bijdr. 996. A shrub; young branches twice as thick as a crow-quill, densely tawny-pilose like the petioles. *Leaves* membranous, olivaceous-green when dry, elliptic, oblanceolate-elliptic or oblong, shortly acuminate, more or less narrowed to the rounded, sometimes slightly oblique, base; upper surface shining, glabrous, except the bold pilose midrib and puberulous nerves, minutely reticulate; lower surface softly and sparsely pilose; length 3 to 5.5 in.; breadth 1 to 2 in.; petiole .2 to .25 in.; stipules linear, pilose, .6 or .7 in. long, deciduous. *Glomeruli* axillary, twice as long as the petioles, few-flowered, the bracts broadly ovate, abruptly acuminate, bearing much yellow hair, especially externally, .7 in. in length. *Flowers* .35 in. long, sessile. *Calyx* campanulate, with 4 deep unequal lanceolate spreading lobes. *Corolla* shorter than the calyx, with a short tube and 4 oblong lobes, glabrous inside, but outside covered like the calyx with long yellow hair. *Anthers* ovate, almost sessile. *Fruit* narrowly ovoid, sparsely hairy, crowned by the accrescent connivent calyx-lobes; length .35 in. (of which nearly half is calyx); pyrenes 4, three-sided, rugose.



PENANG: at 1500 feet; *Curtis* 760. PERAK: *Ridley* 9726.

A very distinct species and not resembling *L. cyanocarpus* Jack, to which some authors have reduced it. It is much more nearly allied to *L. subinæqualis*, King & Gamble.

7. *LASIANTHUS PILOSUS*, Wight in Calc. Journ. Nat. Hist. VI. 506.

A shrub or small tree; young branches about as thick as a goose-quill; covered like the petioles and undersurfaces of the leaves (and often the stipules and inflorescence) with very dark short rusty tomentum, sometimes tinged with green. *Leaves* coriaceous, dark olivaceous-brown when dry, oblong or elliptic-lanceolate, the apex sub-acute or shortly and abruptly acuminate, the base sub-cuneate or rather rounded; both surfaces boldly and transversely reticulate when dry; the upper sparsely pilose or glabrous except sometimes the depressed faint midrib, hirsute; the lower sub-glabrous or sparsely hairy between the prominent adpressed-tomentose main-nerves, the midrib bold on the lower surface, depressed and glabrous on the upper; main-nerves 9 to 13 pairs, curved, ascending; length 4.5 to 6 in.; breadth 1.25 to 2.5 in.; petiole .1 to .3 in.; stipules triangular-lanceolate, acute, hairy, about .1 in. long. *Cymes* glomerulate, sessile, few-flowered, longer (sometimes shorter) than the petioles. *Flowers* sessile; bracts shorter than the calyx, hirsute. *Calyx* about .2 in. long, cupular-campanulate, hirsute outside, with about 5 triangular teeth. *Corolla* 5- to 7-cleft, dirty purple, shortly campanulate. *Fruit* blueish-black and ultimately glabrous, sub-globular, not longer than the persistent calyx-lobes; pyrenes 5 to 7. Hook. fil. Fl. Br. Ind. III. 182. *L. setosus*, Wight in Calc. Journ. Nat. Hist. VI. 506; Hook. fil. Fl. Br. Ind. l.c. 181.

MALACCA: *Griffith* (K.D.) 2918; *Maingay* (K.D.) 869; *Cuming* 239; *Hervey*. PERAK: at elevations of about 5000 feet; *Wray* 876. JOHORE: *Ridley* 11180. SELANGOR: *Ridley* 8231.

VAR. *angustifolia*, King & Gamble; branches more hirsute and with greenish-brown tomentum; leaves rather membranous, their lower surfaces sparsely and shortly pilose between the nerves, 4 or 5 in. long and 1 to 1.15 in. broad; stipules lanceolate.

MALACCA: *Griffith*; *Maingay*. PERAK: *Scortechini* 374?—DISTRIB. Burma.

VAR. *glabra*, King and Gamble; leaves with only 9 to 11 pairs of nerves, their upper surfaces quite glabrous even on the midrib, the reticulations not depressed and not very distinct.

SELANGOR: *Ridley* 7424.

8. *LASIANTHUS RIDLEYI*, King & Gamble, n. sp. A shrub; young branches, petioles and under surfaces of the midribs of the leaves densely and softly pubescent. *Leaves* membranous, narrowly elliptic, somewhat

oblanceolate, sub-acute, tapering in the lower third to the slightly rounded base; both surfaces olivaceous when dry; the upper glabrous, shining, with the midrib and nerves slightly prominent; the lower paler with prominent transverse reticulations, downy between the veins; main-nerves 8 or 9 pairs, slightly curved, ascending, thin but distinct on the lower surface like the midrib; length 7 to 8 in.; breadth about 2·5 in.; petiole about 2 in.; stipules linear, hirsute. *Glomeruli* shorter than the petioles, bearing a few flowers hidden amongst numerous linear bracts with many pale spreading hairs. *Calyx* sessile, 15 in. long, narrowly campanulate; the tube glabrous; the lobes 5, acuminate, erect, covered outside with long stiff white hairs. *Corolla* and fruit unknown.

SINGAPORE: *Ridley* 3620a.

9. *LASIANTHUS FLAVICANS*, King & Gamble, n. sp. Young branches thinner than a goose-quill, clothed with dense short yellowish-brown deciduous tomentum like the petioles. *Leaves* thickly membranous, narrowly elliptic, the apex acuminate, the base cuneate; upper surface olivaceous-green, glabrous except the lower part of the midrib, the nerves indistinct, shining; lower surface darker and with much short minute pubescence, especially on the 5 or 6 pairs of sharply ascending bold main-nerves and conspicuous transverse veins; length 5 to 7 in.; breadth 1·25 to 2 in.; petiole 3 to 35 in. short; stipules shorter than the petioles while in flower (longer in fruit), oblong, blunt or acute, adpressed to the stem, pubescent. *Glomeruli* about as long as the petioles, few-flowered, bearing numerous linear very pubescent bracts shorter than the flowers. *Flowers* few, sessile or nearly so, 3 in. long. *Calyx* narrowly campanulate, glabrous, constricted below the 4 large triangular, spreading sparsely hirsute teeth. *Corolla* twice as long as the calyx and exceeding the bracts, clavate in bud, glabrous outside except for a few hairs on the back of the lobes, villous inside, salver-shaped, the limb with 4 broad triangular teeth. *Anthers* 4, broadly ovate, on short filaments; style as long as the corolla. *Fruit* elliptic, pointed towards each end, the apex crowned by the small calyx-teeth, glabrous, 45 in. long, and 25 in. diam.; pyrenes 4, rugulose.

SINGAPORE: in the Botanical Garden jungle; *Ridley* 4394, 6927.

PERAK: *Scortechini*. PAHANG: *Ridley* 2223; *King's Collector* 10974.

VAR. *subglabra*, King, hairs short, often deciduous.

PERAK: *Curtis* 1334. SELANGOR: *Ridley* 4895.

10. *LASIANTHUS LONGIFOLIUS*, Wight in Calc. Journ. Nat. Hist. VI. 514. Shrub or small, tree? All parts quite glabrous; young branches as thick as a goose-quill, black when dry. *Leaves* coriaceous, broadly or narrowly elliptic, sometimes oblong or oblanceolate-elliptic, sub-acute or shortly and bluntly acuminate, much narrowed to the petiole,

both surfaces shining, boldly and transversely reticulate, the lower scaberulous; main-nerves 11 to 13 pairs, curved, spreading and like the midrib very prominent and minutely hispid on the lower, less prominent and glabrous on the upper; length 8 to 10 in.; breadth 2 to 3·5 in.; petioles ·3 to ·4 in.; stipules nearly as long as the petioles, coriaceous, triangular, sub-acute or blunt, partly covering the inflorescence, deciduous. *Cymes* shorter than the petioles, sessile. *Flowers* 4 to 6, sessile, surrounded at their bases by small rufescent fimbriate bracts much shorter than themselves. *Calyx* ·2 in. long, sessile, coriaceous, tubular, with 4 small blunt teeth, slightly puberulous outside. *Corolla* not seen. *Ovary* 4-celled, 4-seeded. Hook. fil. Fl. Brit. Ind. III. 187.

MALACA: *Griffith* (K.D.) 2936; *Maingay* (K.D.) 867. PERAK: *Wray*; *Ridley* 7190. SELANGOR: *Ridley* 4904.

11. *LASIANTHUS CONSTRICTUS*, Wight in Calc. Journ. Nat. Hist. VI. 515. A shrub; young branches twice as thick as a crow-quill, compressed or sub-terete, like the petioles sparsely and deciduously strigose. *Leaves* membranous or thinly coriaceous, narrowly elliptic or elliptic-oblong, sometimes oblanceolate-elliptic, the apex rather bluntly acuminate, the base cuneate or rounded; both surfaces pale-olivaceous, minutely reticulate, and more or less shining when dry; the midrib on the lower surface minutely and sparsely strigose, otherwise both glabrous; main-nerves only 3 to 5 pairs, ascending and little curved, thin but distinct; length 3·5 to 5·5 in.; breadth 1·25 to 2·5 in.; petioles ·15 to ·2 in., corrugated, sparsely pubescent; stipules shorter than the petioles, lanceolate, adpressed-hairy, deciduous. *Cymes* sessile, shorter than the petioles (sometimes slightly longer) condensed, 4- to 6-, rarely 10-flowered; bracts minute or more usually absent, *Flowers* small, sessile or sub-sessile. *Calyx* ·1 to ·15 in. long, thick, narrowly campanulate, constricted below the 4- (rarely 3- to 5-) toothed mouth; teeth triangular, spreading, sparsely hairy. *Corolla* longer than the calyx, funnel-shaped, glabrous outside, the tube ·25 in. long, villous inside, the limb as long as the tube and with 5 sub-acute lobes. *Fruit* obliquely ellipsoid, tapering to each end, somewhat compressed, 4-ridged, rugulose, crowned by the small calyx, glabrous, ·35 in. long; and ·3 in. in diam.; pyrenes 4, sub-cylindric. Hook. fil. Fl. Br. Ind. III. 188 (excl. syn. Kurz Fl. Burm.) *Mephitidea* sp. Griff. Notul. IV. 267 t. 474, fig. 4.

SINGAPORE: *Ridley* 4902. SELANGOR: *Ridley*. BURMA: *Griffith*. PERAK: *King's Collector* 2564, 2780, 3591, 6065; *Scortechini*. PAHANG: *Ridley* 2222. JOHORE: *Ridley* 11183, 11189.—DISTRIBUTION: Sumatra, *Beccari* P.S. 952; Borneo, *Haviland*.

12. *LASIANTHUS SINGAPORENSIS*, King & Gamble n. sp. A shrub?



Young branches, petioles and under surfaces of the leaf-midribs cinereous-pilose. *Leaves* thinly coriaceous, narrowly elliptic, more or less oblanceolate, tapering to each end, the apex obtusely acuminate; upper surface olivaceous when dry, glabrous, shining, the midrib distinct and channelled, the nerves rather faint; under surface pale-cinereous, minutely and softly pubescent, the 6 or 7 pairs of spreading ascending main-nerves bold like the transverse veins; length 5 or 6 in.; breadth 1.75 in.; petiole .2 in.; stipules linear, hirsute, about as long as the petioles. *Cymes* sessile, shorter than the petioles, 4- to 6-flowered; bracts 2 or 3 at the base of each flower, linear-hirsute, about as long as the calyx. *Flowers* .4 in. long, sessile. *Calyx* .1 in. long, campanulate, the tube narrow, the limb wide with 5 deep triangular acute spreading teeth. *Corolla* funnel-shaped, .3 in. long, outside glabrous except for a few hairs near the mouth, inside villous; lobes of the mouth 5, narrow. *Anthers* 5, narrowly oblong. *Fruit* unknown.

SINGAPORE: Ridley 9095.

13. *LASIANTHUS ELLIPTICUS* Wight in Calc. Journ. Nat. Hist. VI. 507. A tall shrub; young branches half as thick as a goose-quill, cinereous or sub-rusty adpressed-pilose like the petioles and under surfaces of the leaves. *Leaves* thinly coriaceous, olivaceous-brown when dry, narrowly elliptic or oblanceolate-elliptic, shortly acuminate, much narrowed to the base; upper surface glabrous, shining, the midrib, nerves and transverse veins rather distinct; main-nerves 7 or 8 pairs, slightly curved, ascending, bold on the under surface like the midrib; length 4.5 to 6.5 in.; breadth 1.5 to 2 in.; petioles .15 to .25 in.; stipules broadly triangular-lanceolate, sub-acute or sometimes bifid, almost glabrous, shorter than the petioles. *Glomeruli* shorter than the petioles, few-flowered, sessile, bearing (mostly on the outside) a few hirsute lanceolate bracts. *Calyx* .25 in. long, widely campanulate, tapering much to the base, deeply divided into 5 triangular acuminate spreading lobes, densely hirsute externally, sparsely so internally. *Corolla* half as long as the calyx, divided almost to the base into 5 oblong blunt lobes, hirsute outside and glabrous inside. *Anthers* 5, short, sessile. *Fruit* unknown. Hook. fil. Fl. Br. Ind. III. 182.

PENANG: at an elevation of 2000 feet; Curtis 1594.

14. *LASIANTHUS SUBSPICATUS*, King & Gamble, n. sp. A small tree; young branches rather thinner than a goose-quill, 2-grooved like the petioles, under surfaces of the leaves and the inflorescence with minute, usually pale, flocculent deciduous pubescence. *Leaves* membranous, ovate-elliptic, much acuminate, the base cuneate; both surfaces brown when dry, the upper quite glabrous, the nerves and reticulations faint; the lower glabrous, except the midrib and nerves, the reticulations

distinct; main-nerves 4 to 6 pairs, oblique rather straight; length 3·5 to 5 in.; breadth 1·25 to 1·85 in.; petioles ·25 in.; stipules elongated triangular, acute, about as long as the petioles, the midrib keeled. *Cymes* spiciform, usually about as long as the petioles, their axes somewhat elongated, bearing a few broadly lanceolate, acute or acuminate bracts much shorter than the 6 to 12 flowers, all parts except the inside of the calyx and the corolla-tube on both surfaces covered with short rather thick hair. *Flowers* sessile, broadly clavate in bud, under ·1 in. long. *Calyx* as long as the corolla-tube, campanulate, with 5 small, spreading, triangular teeth. *Corolla*-tube much shorter than the sub-globular bluntly 5-lobed limb. *Anthers* 5, linear, embedded in the dense white hair which lines the inside of the lobes. *Fruit* unknown.

PENANG: *Curtis* 2476. PERAK: *Wray* 863.

15. *LASIANTHUS WRAYI*, King & Gamble, n. sp. A small tree; young branches twice as thick as a crow-quill, slightly compressed, densely adpressed-pubescent. *Leaves* thinly coriaceous, oblong-lanceolate, tapering much and about equally to each end; upper surface quite glabrous, shining, faintly reticulate, olivaceous-brown; lower surface darker, adpressed-pubescent on the midrib and 5 pairs of rather bold ascending little-curved nerves, the connecting veins bold, horizontal, puberulous, the areolæ glabrous; length 3·5 to 5 in.; breadth ·75 to 1 in.; petioles about ·3 in.; stipules triangular, acuminate, much shorter than the petioles. *Flowers* ·15 in. long, two or three on a very short axillary tubercle having a few short broad pubescent bracts at its base. *Calyx* ·05 in. long; sessile, campanulate, with 4 small acute teeth, adpressed-hirsute like the tubular corolla; teeth of corolla blunt. *Anthers* 4, linear-oblong, inserted by short filaments in the villous ring in the throat. *Fruit* unknown.

PERAK: at an elevation of 4500 feet; *Wray* 257.

16. *LASIANTHUS KURZII*, Hook. fil. Fl. Br. Ind. III. 183. A shrub? Young branches twice as thick as a crow-quill, densely olivaceous-tomentose like the petioles, stipules, and under surfaces of the midribs and main-nerves of the leaves. *Leaves* thinly coriaceous, oblong, acute at both ends: upper surface dark olivaceous-brown, glabrous, shining, the midrib somewhat depressed (when dry); lower surface dark-olivaceous, pubescent on the distinct horizontal veins and on the 6 or 7 pairs of ascending main-nerves, also on the veins and on the interspaces; length 3·5 to 4·5 in.; breadth ·75 to 1·25 in.; petioles ·15 to ·2 in.; stipules lanceolate with broad bases, shorter than the petioles. *Cymes* sessile, condensed, few-flowered, without the corolla shorter than the petioles, with the corolla longer; bracts oblong, acuminate, few. *Flowers* ·3 in.

long, sessile. *Calyx* sparsely pilose, ovoid, tapering to the small 4-toothed mouth. *Corolla* pilose outside, white, longer than the calyx, salver-shaped, the tube narrowly funnel-shaped; its limb with 4 broad blunt hairy teeth each bearing near its base an oblong anther on a short filament. *Fruit* (*vide* Curtis) blue, .5 in. long.

PENANG: at an elevation of 2000 feet; *Curtis*. SINGAPORE: *Ridley* 140.

We refer this to *L. Kurzii* with some hesitation, for it does not absolutely agree with specimens from the Andamans so named by Sir Joseph Hooker.

17. *LASIANTHUS SUB-INEQUALIS*, King & Gamble, n. sp. A shrub 3 to 5 feet high: young branches rather thicker than a crow-quill, densely rusty-tomentose like the short petioles. *Leaves* membranous, oblong-lanceolate, shortly acuminate, very little or not at all narrowed to the rounded sub-cordate, slightly oblique base; both surfaces pale, olivaceous-brown when dry; the upper sparsely pilose, densely so on the midrib; lower surface more or less pilose everywhere, densely so on the prominent midrib and 8 to 10 pairs of spreading curved main-nerves; length 2 to 3.5 in.; breadth .75 to 1 in.; petiole under .1 in.; stipules ovate to elliptic, sometimes tapering to each end, pilose, .35 to .5 in. long. *Glomeruli* few-flowered, axillary, not so long as the stipules, their bracts like the stipules but smaller. *Flowers* few, about .3 in. long, sessile. *Calyx* deeply divided into 4 unequal lanceolate lobes. *Corolla* about .15 in. long, divided into 4 short lobes, hairy outside like the calyx, concave and glabrous inside. *Anthers* 4, oblong, sessile. *Fruit* .35 in. long, of which half is formed by the persistent calyx-lobes, globular, blue, sparsely hirsute; pyrenes 4, three-sided, smooth.

PERAK: *King's Collector* 157, 3358; *Wray* 2588, 3451; *Ridley* 9715; *Scortechini* 189.—DISTRIB. Sumatra: *Forbes* 2457: Java; on Mounts Salak and Pangerango.

Allied closely to *Lasianthus inaequalis* Bl.; King & Gamble, but with narrower subsessile leaves and much more conspicuous stipules, which are ovate or elliptic not linear.

18. *LASIANTHUS CORONATUS*, King & Gamble, n. sp. Young branches rather thicker than a crow-quill, covered like the petioles, stipules and lower surfaces of the leaf-midribs and main-nerves with soft brown tomentum. *Leaves* coriaceous, oblong-lanceolate, much acuminate, the base cuneate; both surfaces pale-brown when dry; the upper quite glabrous, except the tomentose lower fourth of the midrib, finely reticulate, the midrib and main-nerves depressed; lower surface darker than the upper, the reticulating veins transverse, bold and pubescent the enclosed spaces almost glabrous; main-nerves 5 or 6 pairs, bold,



spreading, tomentose; length 3 to 3·5 in.; breadth ·75 to 1 in.; petioles about ·1 in.; stipules linear, twice as long as the petioles. *Cymes* longer than the petioles, few-flowered, bearing a few linear tomentose bracts as long as the stipules and resembling them. *Calyx & corolla* unknown. *Fruit* sub-globular, somewhat narrowed at the base, the apex truncate, the sides deeply 5-grooved, the interspaces pubescent and rugulose, about ·25 in. long, crowned by the equally long or longer erect linear pubescent calyx-lobes; pyrenes 5, bony.

PERAK: *Scortechini* 329.

A plant known only from *Scortichini's* imperfect specimens; named from the long conspicuous calyx-lobes on the apex of the fruit.

19. *LASIANTHUS APPRESSUS*, Hook. fil. Fl. Br. Ind. III. 181. A shrub; young branches thinner than a goose-quill, softly and densely hirsute like the petioles, stipules and bracts. *Leaves* sub-coriaceous, oblong-lanceolate, shortly acuminate, the base cuneate (often rather abruptly so); upper surface pale olivaceous-brown, glabrous, shining, the main-nerve and midrib depressed, the latter with 1 or 2 lines of adpressed hairs; lower surface paler and bearing many sub-adpressed yellowish hairs; especially on the main-nerve and rather prominent transverse veins; main-nerve 6 or 7 pairs, curved, ascending, bold and prominent on the lower surface; length 2 to 3 in.; breadth ·5 to ·75 in.; petiole ·1 to ·15 in. long; stipules oblong, blunt, adpressed to the stem, rather shorter than the outer flower-bracts. *Flowers* about ·15 in. long, sessile, sub-solitary, surrounded by linear-lanceolate, acuminate, hirsute bracts, the outer of which are ·25 in. long, the inner being smaller. *Calyx* campanulate, sparsely pilose, the limb with 4 short triangular rather blunt teeth. *Corolla* minute. *Fruit* depressed-globular, crowned by the short calyx-lobes, ·15 in. in diam., sparsely pilose; pyrenes 8, three-sided, smooth. *Lasianthus*, Wall. Cat. 8443 and 8442 partly.

MALACCA (on Mount Ophir) *Griffith* (K.D.) 2927. PENANG: *Wallich*; *King*; *Deschamps*. JOHORE: *Ridley* 2925, 11183 and 4. PERAK: *Scortechini*.

20. *LASIANTHUS ATTENUATUS*, Jack in Trans. Linn. Soc. XIV. 126. A shrub; young branches not much thicker than a crow-quill, covered like the petioles, and upper surfaces of the leaf-midribs with dense short cinereous-olivaceous tomentum. *Leaves* membranous, oblong, lanceolate, shortly acuminate, the base rounded and somewhat oblique upper surface (except the midrib) glabrous, dark-olivaceous; the lower paler, minutely pilose, especially on the midrib and 7 or 8 pairs of spreading ascending rather bold main-nerve; the reticulations faint; length 2 to 3·5 in.; breadth ·75 to 1 in.; petioles about ·1 in.; stipules

lanceolate, closely adpressed to the stem, as long as the flower-bracts and hirsute like them. *Flower-bracts* lanceolate or oblanceolate, tapering to each end, .25 to .3 in. long. *Flowers* 1 to 3, sessile. *Calyx* .2 in. long, cleft to the base into 4 lanceolate acuminate hirsute lobes. *Corolla* shorter than the calyx, narrowly campanulate, with 4 short lobes, densely hirsute outside, but glabrous within. *Anthers* 4, oblong, sessile. *Fruit* (fide *Jack*) "ovoid, hairy, dark-blue, pyrenes 4." Wight in Calc. Journ. Nat. Hist. VI. 504; Hook. fil. Fl. Br. Ind. III. 181. *Mephitidia attenuata*, DC. Prod. IV. 452.

MALACCA: *Griffith* (K.D.) 2926. PERAK: *King's Collector* 237, SINGAPORE: *Ridley* 6517, 6830, 9224.

Allied to *L. appressus*, Hook. fil., but with different pubescence and bracts and rather more nerves in the leaves.

21. *LASIANTHUS DENSIFOLIUS*, Miq. Fl. Ind. Bat. II. 321. A shrub; all parts more or less clothed with coarse flexuose pale-olivaceous hairs with bulbous bases. Young branches slightly thicker than a crow-quill. *Leaves* membranous, nearly sessile, narrowly oblong-lanceolate, somewhat oblique and emarginate, but not narrowed at the base, the apex shortly acuminate; both surfaces olivaceous-brown when dry; main-nerves 8 to 10 pairs, ascending, slightly curved, thin but prominent on the lower surface, faint on the upper; length 1.75 to 2.75 in.; breadth .6 to .8 in.; petioles under .1 in.; stipules lanceolate, densely hirsute, .25 to .3 in. long. *Cymes* axillary, sessile, few-flowered, rather more than twice as long as the petioles; bracts linear, hispid. *Flowers* few, sessile. *Calyx* .2 in. long, with 4 or 5 deep very unequal, lanceolate hispid lobes. *Corolla* much smaller than the calyx with oblong and less hairy lobes. *Anthers* 5, sessile, oblong, opposite the lobes. *Fruit* blue, sub-globular, sparsely hispid, surmounted by the calyx-lobes, .2 or .25 in. in diam.; pyrenes 4. Hook. fil. Fl. Br. Ind. III. 182. *Lasianthus*? Wall. Cat. 8441 in part.

This is very closely allied to the Indian species *L. Wallichii*, Wight.

MALACCA: *Maingay* (K.D.) 868. JOHORE: *King*. SINGAPORE: *Wallich*; *Anderson* 88; *Morton* 142; *Ridley* 4898, 5679. SELANGOR: *Ridley* 7421.

VAR. *latifolia*, King. *Leaves* broadly oblong with a short broad abrupt acumen, the base broad, oblique, sub-cordate, and more than 1 in. broad; young branches and inflorescence densely covered with coarse hair, 2.25 in. long.

JOHORE: *Ridley* 10948. SELANGOR: *Ridley* 7423.

VAR. *calycina*, King. *Leaves* glabrous on the upper surface except

for a very few scattered adpressed hairs and for the strigose midrib; main-nerves not more than 8 pairs; *fruit* crowned by calyx-lobes as long as itself.

SINGAPORE: *Ridley* 5679.

22. *LASIANTHUS ROBUSTUS*, King & Gamble, n. sp. Young branches terete, sub-glabrous, about as thick as a goose-quill. *Leaves* large, coriaceous, pale-olivaceous on both surfaces (when dry) and glabrous, oblanceolate, much narrowed but not acute at the base; upper surface corrugated from the depression of the nerves and veins, the midrib thin but prominent; under surface with bold large reticulations and stout midrib, the 16 to 20 pairs of curved ascending main-nerves thin but prominent length 8 to 12 in.; breadth 2.5 to 3.25 in.; petioles .4 in., stout, channelled; stipules coriaceous, sagittate, pale, about .4 in. long (measured to the end of the basal lobes). *Cymes* shorter than the petioles, condensed, ebracteate, few-flowered. *Calyx* shortly campanulate, glabrous, about .1 in. long, the mouth with 5 or 6 obscure teeth. *Corolla* unknown. *Fruit* sub-globular, 6-ridged, glabrous, crowned by the short calyx-tube, .15 in. in diam., pyrenes 5 or 6.

MALACCA: (at Ayar Pannas) *Ridley* (without number).

Only a single specimen seen by me, and that a poor one.

23. *LASIANTHUS CORIACEUS*, King & Gamble, n. sp. A small foetid shrub; young branches terete or somewhat compressed, minutely puberulous, the bark thick, pale and rugulose when dry. *Leaves* very coriaceous, oblong-elliptic, gradually and bluntly acuminate, the base cuneate; upper surface pale-brown when dry, everywhere glabrous, shining, the stout midrib and the main-nerves depressed; lower surface pale cinereous-brown, glabrous, dull; the midrib very stout and prominent; main-nerves 10 to 12 pairs, spreading but also ascending, ultimately glabrous, but like the midrib at first minutely adpressed, puberulous; intermediate nerves none, reticulations wide and indistinct; length 7 to 11 in.; breadth 2.5 to 3.5 in.; petiole about .4 in. stout, channelled; stipules triangular acuminate, half as long as the petioles. *Cymes* axillary, rather longer than the petioles, on short peduncles, ebracteate, bearing 3 to 5 sessile flowers. *Calyx* .15 in. long, widely tubular, truncate. *Corolla* unknown. *Fruit* (fide *Scortechini*) deep purple, .25 in. in diam., minutely hairy, crowned by the truncate, entire or faintly 4-toothed calyx-limb; pyrenes 4.

PERAK: *Scortechini* 332. SELANGOR: *Ridley* 10217, 8540 *in part*.

This is very like *L. pergamaceus* K. & G., which however is a tree with very thick leaves indistinctly veined.

24. *LASIANTHUS PERGAMACEUS*, King & Gamble, n. sp. A tree; young



branches, under surfaces of leaves, and outside of calyx and corolla minutely but deciduously puberulous; all other parts except the corolla quite glabrous. *Leaves* thinly coriaceous, oblong-elliptic, shortly and rather bluntly acuminate, the base cuneate; both surfaces pale hepatic-brown when dry and reticulate, the upper in all stages quite glabrous, the lower ultimately becoming so; the midrib very bold on the lower, less so in the upper surface; main-nerves 10 pairs, thin but distinct, spreading and ascending, many of the intermediate nerves prominent and spreading like the main ones, the reticulating veins delicate and forming square or rhomboidal areolae; length 8 to 10 in.; breadth 2 to 2·75 in.; petiole ·3 to ·4 in.; stipules ·15 in. long with broad bases and abrupt oblong points. *Oymes* not much exceeding the petioles, ebracteate, 4-or 5-flowered, shortly pedunculate. *Flowers* ·5 in. long, sessile. *Calyx* ·25 in. long, tubular, the mouth truncate but obscurely toothed. *Corolla* much longer than the calyx, tubular, sub-inflated below the broadly 4-toothed limb, thick (almost fleshy), coarsely pubescent on one side externally, more or less villous everywhere internally. *Anthers* 4, narrowly oblong, on short thick filaments. *Fruit* unknown.

PERAK: at an elevation of 4500 feet on Gunong Batu Pateh, Wray 270.

Mr. Wray describes the whole plant as very foetid when bruised.

25. *LASIANTHUS MALACCENSIS*, King & Gamble, n. sp. A small tree; young branches twice as thick as a crow-quill, terete, puberulous, very dark in colour when dry. *Leaves* coriaceous, oblong-lanceolate, bluntly acuminate, the base rounded but slightly contracted just above its junction with the petiole; the edges somewhat wavy; both surfaces glabrous except for a few minute adpressed hairs on the midrib and nerves, dark olivaceous-brown, reticulate when dry; main-nerves 8 or 9 pairs, curved, ascending abruptly, thin and inconspicuous; length 4 to 5 in.; breadth 1 to 1·4 in.; petiole ·3 in. *Stipules* much shorter than the petioles, the base broad, abruptly narrowed into the triangular apex. *Flowers* two or three together in the leaf-axils. *Calyx* sessile, campanulate, tapering to the base, less than ·1 in. long, puberulous outside the mouth, wide and minutely 5-toothed. *Fruit* sub-globular, pulpy, surmounted by the 5 or 6 blunt short calyx-teeth, ·2 in. in diam.; pyrenes 4, narrow, smooth.

MALACCA: Ridley 3219.

26. *LASIANTHUS CHINENSIS*, Benth. Fl. Hongkong 160. A shrub 8 to 12 feet high; young branches rather thinner than a goose-quill, angled, the bark dark-brown when dry, sparsely and minutely adpressed-pubescent. *Leaves* dark olivaceous-brown when dry, thinly coriaceous, elliptic-

oblong, shortly acuminate, narrowed to the base; surface reticulate, glabrous, except for a few adpressed hairs near the base, and on the midrib and longer nerves; main-nerves 8 or 9 pairs, thin, prominent on the lower surface, slightly curved, ascending; length 5 to 6·5 in., breadth 1·5 to 2 in.; petiole stout, adpressed rusty-pubescent, about ·15 in. long; stipules triangular, shorter than the petioles. *Cyme*, ebracteate, axillary, few-flowered, sessile, about twice as long as the petioles. *Flowers* 4 in. long, on pedicels much shorter than themselves. *Calyx* adpressed-pubescent, campanulate, deeply divided into 4 or 5 somewhat spreading, lanceolate, acuminate lobes. *Corolla* glabrous outside, longer than the calyx, salver-shaped; the tube densely pilose inside; the lobes oblong, thickened at their apices, reflexed. *Filaments* about as long as the 5 or 6 linear anthers. *Fruit* unknown. Hook. fil. Fl. Br. Ind. III. 187.

PERAK: *King's Collector* 2582, 10100.

The collector, in his field-note, describes the corolla as white and the calyx as blue.

27. *LASIANTHUS WIGHTIANUS*, Hook. fil. Fl. Br. Ind. III. 188. A shrub? Young branches compressed, varying in thickness, some as thick as a goose-quill, all as well as the petioles, the backs of the stipules, the under-surfaces of the main-nerves, and both sides of the midrib of the leaves minutely rusty adpressed-pubescent. *Leaves* dark-brown when dry, elliptic-oblong, the apex shortly acuminate, the base rounded, rarely sub-acute; upper-surface finely reticulate, the veins and nerves sparsely strigose; under-surface strongly reticulate, the veins and nerves pubescent; main-nerves 10 to 13 pairs, very prominent, curved, spreading; length 3·5 to 4·25 in.; breadth 1·25 to 1·5 in., petioles ·1 to ·15 in.; stipules triangular, acuminate, as long as the petioles. *Cymes* slightly longer than the petioles, few-flowered, ebracteate. *Flowers* clustered, sub-sessile. *Calyx* pubescent, ·1 in. long, narrowly campanulate, with 5 small triangular spreading teeth. *Corolla* and *fruit* unknown. *Mephitidea venosa*, Wight in Calc. Journ. Nat. Hist. VI. 514, not of Blume.

MALACCA: on Mount Ophir, *Griffith* (K.D.) 2922.

28. *LASIANTHUS PTEROSPERMUS*, Wight in Calc. Journ. Nat. Hist. VI. 510. A shrub; young branches half as thick as a goose-quill, compressed especially at the nodes, strigose-puberulous, becoming subglabrous. *Leaves* coriaceous, elliptic or oblong-elliptic, shortly and bluntly acuminate or sub-acute, narrowed to the slightly oblique, rarely sub-acute, base; both surfaces when dry reticulate, pale-brown, tinged with olivaceous, the upper glabrous, the lower minutely substrigose

the midrib and main-nerves depressed on the upper surface (when dry); main-nerves 10 to 12 pairs, spreading, ascending, prominent on the lower surface; length 5 to 7 in.; breadth 1·25 to 2·25 in.; petioles ·2 to ·25 in.; stipules oblong-lanceolate, blunt, strigose, ·35 in. long. *Cymes* only slightly longer than the petioles, 3- to 4-flowered. *Flowers* sessile, with a few minute bracts or without any. *Calyx* sessile, ·15 in. long, strigose, the limb with 5 short obtuse triangular teeth. *Corolla*, globose, glabrous. *Drupe* sub-globose, ·5 in. in diam. when fresh, only ·3 in. when dry, glabrous, black, crowned by the shortly tubular calyx-limb; pyrenes 4 to 5, trigonous, bisulcate on the back and with 3 vertical processes, the middle one thick and rugulose, the two lateral thin and wing-like.

MALACCA: *Griffith* (K.D.) 2929; *Maingay* (K.D.) 866.

29. *LASIANTHUS PERAKENSIS*, King & Gamble, n. sp. A shrub or small tree; young branches half as thick as a goose-quill, deciduously and minutely rusty-puberulous like the petioles, stipules and under surfaces of the midrib and main-nerves. *Leaves* thinly coriaceous, narrowly elliptic or obovate-elliptic, abruptly and shortly acuminate, narrowed in the lower third to the short petiole; upper surface dark-olivaceous, quite glabrous, shining, the midrib and nerves not prominent; under surface paler olivaceous, glabrous except the puberulous midrib and 7 or 8 pairs of prominent ascending, little-curved main-nerves; the veins very bold, transverse; length 6 to 10 in.; breadth 1·75 to 3·25 in., petiole ·2 to ·25 in.; stipules triangular, acute, shorter than the petioles, adpressed to the stem. *Glomeruli* about as long as the petioles, condensed, ebracteate or with a few small linear hairy bracts shorter than the calyx. *Flowers* sessile, crowded. *Calyx* campanulate, much tapered to the base, the mouth wide and with 5 indistinct blunt, spreading lobes, pubescent. *Corolla* not seen; ovary 5-celled. *Fruit* hemispheric, sub-glabrous, ribbed, crowned by the calyx; pyrenes 5.

PERAK: *King's Collector* 682, 2438, 2838, 10210; *Wray* 4128.

Resembling *L. Maingayi* in leaves but with 5-merous flowers.

30. *LASIANTHUS ANGUSTIFOLIUS*, King & Gamble, n. sp. Small tree; young branches covered with a thin dense layer of adpressed minute pale-brown tomentum. *Leaves* thickly membranous, narrowly oblong-lanceolate, caudate-acuminate, the base cuneate; both surfaces brown when dry; the upper the darker, glabrous except the tomentose midrib; the lower glabrous except the pubescent midrib and nerves; the reticulations transverse strong on the lower surface, faint on the upper; main-nerves 12 to 14 pairs, slightly curved, ascending, thin but distinct on the lower, indistinct on the upper surface; length 5 or 6 in.; breadth



.6 to 75 in.; petiole .15 in.; stipules lanceolate, much shorter than the petioles, their edges ciliate. *Cymes* axillary, 2- to 3-flowered, ebracteate, sessile, shorter than the petioles. *Flowers* about .2 in. long, sessile. *Calyx* adpressed pubescent on both surfaces, tubular-campanulate, with 5 triangular-acuminate, slightly spreading teeth. *Corolla* slightly longer than the calyx, tubular, slightly inflated below the mouth; lobes 5, lanceolate, acuminate, sub-erect; the tube glabrous on both surfaces and the teeth adpressed-pubescent on both. *Anthers* small, narrowly oblong. *Fruit* ovoid-globular, crowned by the spreading calyx-lobes, about .2 in. long; pyrenes 4 or 5, rugulose.

PERAK: on Gunong Batu Pateh at 4500 feet, *Wray* 413.

31. *LASIANTHUS OBLONGUS*, King & Gamble, n. sp. Young branches slightly thicker than a crow-quill, somewhat angled, densely but very minutely adpressed-pubescent. *Leaves* membranous, narrowly oblong-lanceolate, gradually tapering into the caudate-acuminate apex, the base much narrowed; both surfaces dark dull-brown when dry, minutely scaly, puberulous on the nerves and midribs, obscurely transverse-reticulate; main-nerves about 7 pairs, curved upwards, not conspicuous; length 3 to 5 in.; breadth .6 to 1 in.; petiole .15 to .2 in.; adpressed-puberulous. *Stipules* lanceolate-acuminate, about .1 in. long. *Cymes* ebracteate, axillary, sessile, 5- to 7-flowered, twice as long as the petioles. *Flowers* .35 in. long, on very short pedicels, adpressed-puberulous or glabrous. *Calyx* campanulate, shallow, the mouth wide, truncate, entire. *Corolla* more than twice as long as the calyx, salver-shaped; the tube slightly widened near the mouth; the limb densely hirsute on its upper surface, the lobes 5, oblong, obtuse. *Anthers* 5, oblong, sub-acute, on short filaments. *Fruit* depressed-globular, about .2 in. in diam. when dry, glabrous, 7- or 8-ridged, somewhat corrugated, crowned by the small calyx; pyrenes 7 or 8, each with a transverse septum dividing it into two cells, the outer of which is 1-seeded, the inner empty.

PERAK: *Scortechini* 265; *Ridley* 4935, 9702, 9729; *Wray* 2590; *King's Collector* 402, 4128, 4462, 10082; *Curtis* 2018. SELANGOR: *Ridley* 7438.

This closely resembles a specimen in Herb. Kew (Horsfield Rub. 52) doubtfully named *Lasianthus sylvestris* Miq., but in that the calyx has 5 distinct triangular acute teeth.

32. *LASIANTHUS MONTANUS*, King & Gamble, n. sp. A bush 4 to 8 feet high; young branches slightly thicker than a crow-quill, rather minutely adpressed-pilose like the stipules. *Leaves* thickly sub-coriaceous, ovate-lanceolate, shortly acuminate, the base cuneate; both

surfaces olivaceous, somewhat shining, reticulate, the upper quite glabrous, the lower pubescent on the bold midrib and thin but prominent 5 or 6 pairs of curved ascending main-nerves, sometimes also on the transverse veins; length 3 to 4.5 in.; breadth 1 to 1.5 in.; petioles .1 to .15 in., stout, stipules about .15 in. long, pubescent, adpressed to the stem, triangular-acuminate. *Flowers* solitary or in pairs, about .5 in. long, ebracteate. *Calyx* nearly as long as the corolla with a short tube and 5 long unequal linear-lanceolate pubescent lobes. *Corolla* white, salver-shaped; the tube long and narrow, pubescent on both surfaces, but especially inside near the base; lobes broad, spreading, somewhat irregular, with tufts of long hair near their apices. *Anthers* 5, short, sessile near the base of the tube. *Fruit* unknown.

PERAK: at elevations of 3000 to 4000 feet, *Wray* 3932; *King's Collector* 2156.

33. *LASIANTHUS CURTISII*, King & Gamble, n. sp. A shrub; young branches somewhat thicker than a crow-quill, sparsely and deciduously pubescent, ultimately glabrous. *Leaves* thickly membranous, olivaceous-brown when dry, lanceolate or elliptic-lanceolate, much acuminate, the base slightly cuneate; upper surface quite glabrous; lower minutely and softly pubescent on the midrib, bold transverse veins and 4 to 6 pairs of stout spreading ascending curved main-nerves; length 2.5 to 3.5 in.; breadth .35 to 1.25 in.; petioles .15 to .2 in., very pubescent; stipules triangular, adpressed to the stem, hirsute, under .1 in. long. *Cymes* not much longer than the petioles, axillary, sessile, 6- to 8-flowered, ebracteate. *Flowers* sessile, .15 to .2 in. long. *Calyx* cleft to nearly the base into 5 sub-equal, linear-lanceolate sub-erect lobes, hirsute externally. *Corolla* much shorter than the calyx, its upper part with dense long yellow hair; lobes 5, short, blunt. *Anthers* 5, sessile, oblong, blunt. *Fruit* ovoid-globular, sparsely pilose, .1 in. long but crowned by the equally long, persistent calyx-lobes; pyrenes 5, broad, 3-angled.

PENANG: *Curtis* 284, 9355.

34. *LASIANTHUS PSEUDO-LUCIDUS*, King, n. sp. A bush; young branches slender, densely and minutely tawny-tomentose. *Leaves* thinly coriaceous, narrowly elliptic-lanceolate, acuminate, the base cuneate, both surfaces pale olivaceous-brown when dry, the upper glabrous; the lower darker, reticulate, puberulous on the midrib and nerves; main-nerves 6 or 7 pairs curved, ascending, distinct on the lower surface; length 2 to 2.5 in.; breadth .6 to .75 in.; petiole about .1 in., pubescent; stipules narrowly oblong-lanceolate, tomentose, .4 in. long. *Cymes* twice as long as the petioles, on short tomentose peduncles, 3- to 4-flowered. *Flowers* sessile. *Calyx* campanulate, .25 in. long, deeply

divided into 5 slightly unequal, linear-lanceolate lobes, hirsute on both surfaces. *Corolla* and fruit not seen.

PERAK: at 5000 feet, *Wray* 4109.

A species near *L. lucidus*, Blume (not of Hook. fil. in Fl. Br. Ind.), but differing from that species in its thicker, less acuminate and rather fewer-nerved leaves, and thicker twigs which are moreover tomentose instead of glabrous. The calyx of this is moreover hirsute instead of glabrous.

35. *LASIANTHUS NERVOSUS*, King & Gamble, n. sp. A small dense shrub 2 to 3 feet high; young branches and petioles covered with dense short olivaceous tomentum. *Leaves* coriaceous, deep olivaceous-brown when dry, shining and minutely reticulate, oblong-lanceolate, the apex acute or sub-acute and mucronate, the base sub-cuneate; upper surface glabrous, the midrib depressed; lower slightly paler, the stout midrib and 6 to 8 pairs of prominent curved ascending nerves minutely adpressed-pubescent; length 1 to 1.5 in.; breadth .4 to .6 in.; petioles .1 to .15 in. long; stipules triangular, much shorter than the petioles, pubescent, caducous. *Cymes* sessile, while in flower shorter than the petioles, 3-flowered. *Flowers* sessile, about .15 in. long. *Calyx* cupular, very short, with 4 triangular teeth. *Corolla* longer than the calyx (about .1 in. long), the tube cylindric, hairy, white; the lobes 4, short, with moniliform hairs inside. *Anthers* attached to the middle of the tube. *Style* shortly bifid. *Berry* bluish, sparsely hairy, globular, .15 in. in diam., crowned by the calyx-teeth; pyrenes 4.

PERAK: *Scortechini* 342.

36. *LASIANTHUS HARVEYANUS*, King & Gamble, n. sp. A shrub; young branches rather thicker than a crow-quill, minutely rusty-tomentose like the petioles and midribs of the leaves on both surfaces. *Leaves* membranous, elliptic or ovate-elliptic, (oblong-elliptic in VAR.); narrowed to the rather blunt (acuminate in VAR.) apex, the base rounded; both surfaces pale-brown when dry; the upper scaberulous and with a few scattered adpressed hairs near the edges; lower surface scabrid-puberulous between the 4- to 6 (8 to 10 in. VAR.) pairs of slender little-curved ascending minutely pubescent main-nerves; length 4 to 5 in. (up to 7.5 in. VAR.) breadth 1.65 to 2 in.; petioles .15 to .2 in.; stipules triangular, acute, one-third or one-half as long as the petioles. *Cymes* longer than the petioles, ebracteate, 3- to 5-flowered. *Flowers* .3 in. long, sessile. *Calyx* under .1 in. in length, narrowly campanulate, densely pubescent, the mouth 4-toothed. *Corolla* both outside and inside less pubescent than the calyx, funnel-shaped; the mouth with 4 ovate and acute spreading lobes. *Anthers* 4, narrowly oblong, shortly apiculate, exserted, attached by short filaments to the densely villous throat; style elongate; stigmas 2 or 3, hairy. *Fruit* unknown.



PERAK: at an elevation of 3400 feet, *Wray* 444.

VAR. *longifolia*. *Leaves* elliptic-oblong, shortly acuminate, as much as 7.5 in. long, with 8 to 10 pairs of nerves.

MALACCA: *Harvey*.

37. *LASIANTHUS FERRUGINEUS*, King & Gamble, n. sp. A bush; young branches about half as thick as a goose-quill, rusty-lanate like the outside of the stipules, the petioles and both sides of the leaf-midribs. *Leaves* dark-brown when dry, thinly coriaceous, oblong-lanceolate, much acuminate, the base rounded or sub-cuneate; upper surface reticulate, sparsely covered with stiff flexuose hairs with conspicuous black bulbs at their bases, shining, the nerves thin but distinct; lower surface more densely hairy (the hairs with smaller bulbs), especially dense on the 16 to 18 pairs of bold curved spreading main-nerves; length 5 or 6 in.; breadth 1.25 to 1.5 in.; petioles .15 to .2 in.; stipules triangular, sub-acute, longer than the petioles, deciduous. *Cymes* small, not so long as the petioles, few-flowered, ebracteate. *Flowers* on short hirsute pedicels. *Calyx* .25 in. long, tubular-campanulate, densely hirsute like the corolla, deeply divided into 5 lanceolate acuminate sub-equal lobes. *Corolla* like the calyx but only half as long, white. *Disk* smooth, glabrous, orbicular. *Style* short, glabrous. *Fruit* unknown.

PERAK: at an elevation of 4500 feet; *Wray* 3911.

38. *LASIANTHUS TOMENTOSUS*, Blume Bijdr. 997. A shrub? Young branches varying in thickness, the longer nearly as thick as a goose-quill, densely clothed like the petioles and stipules with dense short rusty tomentum. *Leaves* thickly membranous, oblong-lanceolate, acuminate, the base cuneate or rounded; upper surface blackish-olivaceous when dry, sparsely and minutely strigose; the lower paler, shortly olivaceous-pilose except the 7 to 10 pairs of curved ascending nerves on their lower surfaces, and the bold midrib on both, which are tomentose; length 2.5 to 3.5 in.; breadth .5 to 1 in.; petiole .1 to .2 in.; stipules about as long as the petioles, triangular. *Cymes* when in flower twice as long as the petioles, when not in flower shorter, condensed, few-flowered, ebracteate, sessile. *Flowers* .2 in. long, sessile. *Calyx* under .1 in. long, widely campanulate, hirsute, the mouth sub-truncate, obscurely toothed. *Corolla* salver-shaped; the tube wide, glabrous outside and inside but with a band of stout hairs at the throat; lobes of the limb ovate, sub-acute, sub-erect, sparsely hirsute. *Anthers* 5, ovate-oblong, on short filaments, curving inward, and cohering by their margins and tips. *Style* as long as the tube of the corolla, cylindric, divided into 2 compressed arms. *Ovary* 5-celled, with a single ovule in each.

PERAK: *Yapp* 525. JOHORE: *Ridley* 11181, 11182, 4083.

This resembles No. 17, but has its leaves hairy on the upper surface, thicker young branches and a much wider corolla-tube.

39. *LASIANTHUS SCALARIFORMIS*, King & Gamble, n. sp. A shrub 5 or 6 feet high; young branches thinner than a goose-quill, minutely rusty-puberulous, faintly ridged, dark-coloured when dry. *Leaves* coriaceous, narrowly elliptic-oblong, the apex very shortly acuminate or acute, much narrowed to the base; both surfaces dark olivaceous-brown when dry, glabrous, shining, the veins scalariform, horizontal, close together, very distinct especially on the lower surface, the midrib thin or the upper surface, stout, convex and often faintly puberulous on the lower surface; main-nerves 7 or 8 pairs, little curved, ascending, broad, bold, and when young, minutely puberulous on the lower surface, always faint and glabrous on the upper; length 4 to 5 in.; breadth 1.25 to 1.5 in.; petioles .25 to .3 in.; stipules minute (about .05 in. long) triangular, with broad bases. *Peduncle* solitary, ebracteate, glabrous, about .5 in. long, bearing at its apex a 3- to 5-flowered cyme. *Flowers* sessile. *Calyx* .2 in. long, campanulate, deeply divided into 5 narrowly oblong acute lobes very minutely puberulous. *Corolla* not seen. *Fruit* glabrous, obovoid, 5-ridged; pyrenes 5.

PERAK: *Scortechini* 411; *Wray*, at an elevation of 6700 feet, 332.

40. *LASIANTHUS FILIFORMIS*, King & Gamble, n. sp. A slender shrub 2 to 4 feet high; young branches rather thicker than a crow-quill, clothed like the other parts of the plant with long spreading rather slender hairs. *Leaves* membranous, subsessile, oblong-lanceolate, shortly acuminate; the base rounded, slightly unequal and minutely caudate, both surfaces olivaceous-brown when dry (sometimes pale), dull, more or less hispidulous-pubescent especially on the midrib and main-nerves; the upper when old sometimes almost glabrous; main-nerves 7 to 9 pairs, thin, but pale and rather conspicuous on the lower surface (when dry), inconspicuous on the upper; length 2 to 2.75 in.; breadth .65 to 1 in.; petiole under .1 in. or almost absent; stipules linear-lanceolate, pubescent, .2 or .25 in. long. *Inflorescence* a slender solitary filiform, sparsely pubescent peduncle .75 to 1 in. long, bearing at its apex one or at most two, flowers subtended by a single or double linear bracteole (by two large leaf-like bracts in var. *bracteata*). *Calyx* with a campanulate tube .1 in. long, and 4 linear-lanceolate erect lobes longer than itself. *Corolla* tubular, exceeding the calyx-lobes, white hairy, deeply 4-lobed. *Ovary* 8-celled. *Fruit* baccate, blue, .25 in. in diam., crowned by the long persistent calyx-lobes.

PERAK: *Scortechini* 29; *King's Collector* 851.

VAR. *bracteata*. Flowers subtended by two ovate acute leaf-like bracts from .3 to .5 in. long.

PERAK: *Scortechini* 180, 190; *Ridley* 8578.

41. *LASIANTHUS GRACILIS*, King & Gamble, n. sp. A slender shrub 2 to 3 feet high, young branches as thick as or thinner than a crow-quill, like the petioles and sometimes the under-surfaces of the midribs densely adpressed-pubescent. *Leaves* stiffly membranous, ovate or sub-rhomboidal, the apex acute and minutely apiculate; the base cuneate, sometimes slightly unequal; both surfaces usually glabrous; the 7 to 9 pairs of main-nerves spreading, little curved, pale and conspicuous beneath; length .6 to .75 in.; breadth .35 to .5 in.; petiole under .1 in.; stipules as long as the petioles, caducous. *Inflorescence* a filiform hairy peduncle shorter than the leaves, bearing at its apex 1 or 2 minute bracteoles and (*vide Scortechini*) 1 to 3 flowers. *Fruit* depressed-globular, glabrous, shining, .15 in. in diam. with 4 vertical ridges; pyrenes 4.

PERAK: *Scortechini* 39, 617. *Ridley* (in tea gardens) 2904.

42. *LASIANTHUS MAINGAYI*, Hook. fil. Fl. Br. Ind. III. 188. A large shrub or small tree; young branches much thinner than a goose-quill, somewhat compressed, covered with deciduous minute rather stiff rusty hairs or sub glabrous. *Leaves* thickly membranous, large, sub-coriaceous, pale-brown, often tinged with olivaceous when dry, narrowly elliptic or sub-ovate-elliptic, shortly and abruptly acuminate; upper surface quite glabrous, shining, the midrib and main-nerves and also the reticulations rather prominent when dry; lower surface rather rough from the bold pale transverse veins; main-nerves 5 or 6 pairs, slightly curved, ascending, thin but prominent; the midrib stout, glabrous or with a few minute hairs; length 5.5 to 8.5 in.; breadth 1.75 to 3 in.; petiole .2 to .3 in.; stipules, lanceolate, acuminate, the base broad, shorter than the petioles, pubescent, deciduous. *Glomeruli* lobulate, shorter than the petioles, sessile ebracteate, the flowers crowded on 2 or 3 short thick branches. *Flowers* about .15 in. long, on very short pedicels, puberulous. *Calyx* about as long as the corolla, campanulate, constricted somewhat below the three blunt or acute triangular teeth. *Corolla* tubular with 3 sub-acute triangular teeth. *Anthers* 3, broadly oblong, emarginate at the apex. *Ovary* 3-celled, style cylindrical. *Fruit* obliquely elliptic, crowned by the small calyx; pyrenes 3, rugulose.

MALACCA: *Maingay* (K.D.) 871. SINGAPORE: *Ridley* 10737; *King* 89; *Hullett* 528. JOHORE: *Ridley* 6516, 11185, 11186, 11187. SELANGOR: *Ridley* 4895. PERAK: *Scortechini*, 678; *King's Collector* 2964.

This resembles No. 13, but is trimerous, its cymes have thick branches and are ebracteate, and its young stems and leaves are glabrous or nearly so.

43. *LASIANTHUS LUCIDUS*, King & Gamble, n. sp. A glabrous foetid shrub; young branches rather thicker than a crow-quill, somewhat compressed, especially at the nodes. *Leaves* thinly coriaceous, oblong-



elliptic or lanceolate, the apex caudate-acuminate, the base much narrowed, both surfaces pale-brown when dry, shining, reticulate; main-nerves 7 to 10 pairs, thin, spreading, interarching .15 in. from the edges, the secondary nerves almost as prominent; length 3.5 to 6 in.; breadth 1.15 to 1.8 in.; petiole .15 to .2 in. or .25 in., slender; stipules minute triangular, much shorter than the petioles. *Cymes* sessile, 4- to 8-flowered, ebracteate. *Flowers* .25 in. long, on short pedicels, narrow, erect. *Calyx* tubular, with 3 broad teeth much shorter than the corolla, glabrous. *Corolla* narrowly tubular, with 3 long narrow-ovate lobes, hairy inside except at the tip. *Anthers* 3, erect, narrowly oblong, not quite so long as their filaments. *Ovary* 3-celled; style long, slender, clavate. *Fruit* sub-trigonous, or sub-didymous, depressed, .2 to .35 in. in diam., shining, blue; pyrenes 2 or 3, oblique sub-pyriform, smooth, each divided into 2 cells by a transverse septum, the anterior cell empty. *Seeds* concave, cupped, fleshy.

PERAK : *Scortechini* 264, 463; *King's Collector* 788, 2797, 2840, 5051; *Ridley* 2928, 5549, 7437, 8574; *Wray* 426, 973, 2807, 3931.

## 52. CHASALIA, Commers.

Characters of *Psychotria* except that the corolla-tube is slender and in one species is usually curved, and the seeds are orbicular plano-concave, the dorsal surface being flat and the anterior deeply concave; almost cupped, albumen uniform.—DISTRIB. About 10 species, tropical Asiatic and African.

In our opinion this genus might with advantage be reduced to *Psychotria*.

Flowers sessile, from .5 to 1 in. long; corolla-tube slender,

curved                   ...                   ...                   ...                   ...   1. *C. curviflora*.

Flowers pedicelled, .15 in. long; corolla-tube wide, straight   2. *C. rostrata*.

1. CHASALIA CURVIFLORA, Thwaites Enum. Pl. Ceyl. 150, 421. A shrub 2 to 4 feet high; everywhere glabrous. Young branches woody, terete, glabrous, dark-coloured when dry. *Leaves* membranous, elliptic, oblong-elliptic, oblong or oblanceolate, shortly and somewhat abruptly and often bluntly acuminate, narrowed at the base; (narrowly elliptic or linear in VARS.) upper surface olivaceous-brown when dry, the lower paler; main-nerves 5 or 6 pairs, much curved, spreading and ascending, thin but distinct on the lower surface like the wide reticulations; length 6 to 8 in.; breadth 1 to 2.75 in.; petioles .3 to .75 in. *Stipules* coriaceous, campanulate-cupular, blunt, .15 to .35 in. deep, the upper edge truncate, entire or 2- or 3-cleft. *Cymes* solitary, terminal, from 1 to 2 in. long, and the same in diam., sometimes on naked peduncles .5 to 1.25 in. or even more in length; branches divergent,

trichotomous, often short, few-flowered. *Flowers* sessile, from .5 to 1 in. long. *Calyx* only .15 in. long, campanulate, the mouth irregularly and shortly toothed. *Corolla* about four times as long as the calyx, the tube long and narrow; its 4 lobes not a quarter of its length, lanceolate, spreading. *Anthers* 4, linear-oblong, deeply cordate at the base, the filaments varying in length. *Style* also varying in length. *Fruit* pisiform, globose sometimes didymous, crowned by the small remains of the calyx, glabrous, pyrenes thin, each with one plano-convex seed. Kurz For. Flora Burma, II. 14; Miq. in Ann. Mus. Lugd. Bat. IV. 202; Hook fil. Fl. Br. Ind. III. 176; Trimen Flora Ceylon III. 363. *C. lurida*, *C. tetrandra*, Miq. Fl. Ind. Bat. 281, 282. *C. Sangiana*, Miq. Fl. Ind. Bat. Suppl. 546. *Psychotria lurida*, Bl. Bijdr. 959; DC. Prod. IV. 521. *P. curvifolia* and *P. ophioxylodes*, Wall. in Roxb. Fl. Ind. ed. Carey & Wall. II. 167, 168; Cat. 8360, 8364; DC. Prod. l.c. 520. *P. ambigua*, W. & A. Prod. 433; Wt. Ic. t. 127. *P. tetrandra*, BC. Bijdr. 961; DC. l.c. 521. *Zwaardekronia lurida*, Korth. in Ned. Kruidk. Arch. II. 252. *Ixora attenuata*, Wall. Cat. 6164. *Psychotria*, Wall. Cat. 8361, 8362, 8363, 8364, 8375; (*in part*) 8386, 8390. *Rubiaceae*, Wall. Cat. 8461.

In all the provinces, common.

The corolla varies in length and is moreover dimorphous as regards the respective length of the stamens and pistils. As regards leaves the plant varies greatly. It seems necessary, however, to separate one Malayan variety.

VAR. *linearis* King & Gamble; leaves linear-oblong from 3.25 to 8.5 in. long, and from .35 to .65 in. in breadth.

MALACCA: *Ridley* 1359: *Goodenough* 1606.

2. CHASALIA ROSTRATA, Miq. in Ann. Mus. Lugd. Bat. IV. 203 excl. syn. *Psychotria tetrandra*. A slender glabrous shrub; young branches thicker than a crow-quill, compressed, pale. *Leaves* membranous, greenish when dry, elliptic or elliptic-oblong, the apex acuminate, the base usually much narrowed but sometimes rounded and oblique; both surfaces more or less distinctly fine-reticulate; main-nerve 5 or 6 pairs, curved, spreading, conspicuous beneath when dry; length 3 to 6 in.; breadth 1.5 to 2 in.; petiole .25 to .4 in.; stipules less than .1 in. long, connate into a short tube, the mouth with a few bristles. *Cymes* solitary, terminal, slender, from .75 to 2 in. long (including the peduncle); bracteoles few, broad, coriaceous; branches divergent trichotomous, few-flowered. *Flowers* .15 in. long, on short pedicels. *Calyx* campanulate; the mouth oblique, irregularly 4- or 5-toothed. *Corolla*-tube wide, only slightly longer than the calyx; the limb about as long as the tube with 4 broad blunt spreading lobes. *Anthers* 3 or 4, ovate, as long as the filaments, included in the corolla-tube. *Fruit* ovoid, smooth, .25 in. long. Hook.

fl. Fl. Br. Ind. III. 177; Miq. Fl. Ind. Bat. II. 281. *Psychotria rostrata* Blume Bijdr. 961. *Polyozus latifolia* (fide Miquel) Bl. Bijdr., 948; DC. Prod. IV. 521, 494.

MALACCA: *Griffith* (K.D.) 3045; *Main gay* (K.D.) 937. JOHORE: *Ridley* 4092. SINGAPORE: *Ridley* 4890. SELANGOR: *Ridley* 7376. DINDINGS, *Ridley* 7992. PERAK: *Scortechini* 1482. *King's Collector* 2190.

We follow previous writers in putting this plant in the same genus as *Chasalia urvijlora*, from which it differs in having a corolla with a short wide perfectly straight tube.